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The Libyan Fisheries Sector:
A Critical Application of Porter's Diamond Model

Fatma Mohammed Saeed

A thesis submitted in partial fulfilment of the requirements of
Sheffield Hallam University
for the degree of Doctor of Philosophy

August 2015

Statement

I declare that this PhD thesis is original and is the end result of my own work. It is submitted in partial fulfilment of the requirements of Sheffield Hallam University for the degree of Doctor of Philosophy and has not been presented to this or any other institution in support of an application of any other degree.

Signed: Fatma Saeed

Date:.................................

ABSTRACT

Libya is one of the developing countries that are rich in oil but plagued by a phenomenon called 'resource curse' — a situation where the tremendous wealth gained from oil export hinders rather than promote economic sustainability. Oil dominates the Libyan economy, accounting for more than 80% of government revenue and exports. As a result, non-oil sectors such as agriculture and manufacturing become unproductive and less competitive nationally and in world markets. As part of the ways to help diversify the Libyan economy and to find sectors of competitive advantage, this thesis applies the Porter Diamond Model (PDM) to Libyan fisheries in order to unravel the current situation whilst also identifying future prospects and development possibilities. Fisheries was selected as the focus for this thesis due to its inherent resource abundance, high potential to play a major role in contributing to economic growth and development within Libya, and finally the sectors ability to strengthen food security and national well-being. Porter's Diamond is a model that explains the competitive advantage some nations or industries have due to certain comparative advantages and helps analyse and improve a country's role in a globally competitive sector. In the Porter's diamond, four interdependent determinants (factor; demand; related and supporting industries; and firm strategy, structure and rivalry) and two indirect variables (chance and government) affects sectors ability to achieve and sustain competitive advantage in the competitive environment. The PDM, including Shepherd's model was applied to Libya to appraise the fish consumption behaviour and evaluate the Libyan fisheries sector's ability to achieve competitive advantage for economic diversification. This is the first study to assess the competitiveness of fisheries in Libya using the PDM framework.

The study adopts a case study approach because it allows gathering of data from multiple sources to accommodate the determinants that affect Libyan fisheries sector in light of the diamond model. Mixed methods where used in this thesis, with data collection methods including questionnaire surveys, interviews and visual materials applied to Eastern Libya. The research reviews, that despite its clear limitations, Porter's diamond model provides a valuable model for appraising the competitiveness of fisheries in Libya. However, this thesis strongly contradicts the PDM in important one area, the role of government when the model is applied to developing nations. In such situations, this study suggests the governments' role should shift from being a complementary to a major determinant in the operation of the model. The research also recommends that the current government be transformed to develop the fisheries sector, by adopting a protectionist approach to advance the sector in a similar manner to that used both other developed countries. Whilst this study makes original contribution to existing knowledge relating to the sector competitive advantage within economies, it is also provides a valuable guide to policy makers looking to diversify existing oil rich economies in both Libya and other similar developing nations. Analysis and finding were organised around the elements of PDM. This study highlights that, marketing outlets are widely unavailable to many consumers; fish prices are high for most citizens; local demand or consumption is low; government policy and regulation towards fishing and marine resources are weak; poor and obsolete infrastructure is common place; equipment and fishing boats are high; regulations of the marine resources sector and fishing is poor; investment and fishing boats are very expensive presenting a significant barrier to market entry for local people; public sector (government) investment in the sector is lacking; no up-to-date modern technique relating to the fisheries sector are available to Libyan fishermen; studies to estimate fish stocks are both dated and insufficient; integration of the sector into the national economy is absent and finally the sector is left in the hands of artisanal and informal fishers. These barriers hinder the process of developing in this sector, preventing Libya's fisheries sector achieving competitive advantage. In addition, the governments' intangible efforts to improve the fisheries sector have been insufficient to ensure food security, diversification, and continued economic growth and development.

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"Who does not thank people does not thank Allah" (Prophet Mohammed peace be upon him)

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List of Abbreviations

AFDB:	African Development Bank Group
AOAD:	Arab Organization for Agricultural Development
EEZ:	Exclusive Economic Zone
ELG:	Export-led growth
EUFIC:	European Food Information Council
FAO:	Food and Agriculture Organisation of the UN
GDP:	Gross Domestic Product
GFCM:	General Fisheries Commission for the Mediterranean
GNP:	Gross National Product
IBRD:	International Bank for Reconstruction and Development
ILO:	International Labour Organization
IMF:	International Monetary Fund
MENA:	Middle East and North Africa
OECD:	Organisation for Economic Co-Operation and Development
OPEC:	Organization of the Petroleum Exporting Countries
PDM:	Porter's Diamond Model
PPP:	Public Private Partnerships
UNEP:	United Nations Environment Programme
USAID:	United States Agency for International Development
WFP:	United Nations World Food Programme
WHO:	World Health Organization
WTO:	World Trade Organisation
WWF:	World Wildlife Fund

Chapter One

General Background and Rationale for the Research Study

1.0 Introduction

This introductory chapter is aimed at familiarising the reader with the background, motivation, aim and objectives of the research. The chapter begins with setting the wider context of this study by examining the challenges countries with resource abundance (such as Libya) encounter in economic growth and development. This background shed light on the necessity and the significance of the research to bridge the gap in literature and to make significant contribution to knowledge and practice. The chapter also captures the motivation for conducting this study and justifies the choice of conceptual approaches. It goes on to explain fisheries and fisheries development in Libya, including development prospects and challenges for contribution to the national economy. The chapter then outlines research questions, aim and objectives of the thesis in Section 1.7 and 1.8. The section (1.9) before the summary describes the structure of the thesis and how the findings are organised. Throughout this chapter, references are made to other chapters where the issues introduced are being discussed afterwards.

1.1 General Background

Libya's oil and gas sector has been recognised as a national heritage and a powerful tool for progress, economic growth and development. It is the main source of income to millions of Libyans and constitutes more than 90% of export revenue and government earnings. The oil sector also accounted for in excess of 75% of the nation's annual government expenditure (Bahgat, 2004:100; Edwik, 2007). In 2012 alone, even with the drop in oil export volumes, about an average US$4 billion was earned per month as net revenues (OPEC, 2013; IMF, 2013; Libya Economy Profile, 2014). Since 1958, Libya's oil sector has been used socially and politically, far beyond the scope of economic development to include nation-building and the pursuit of socialist principles (Ejigu and Sherif, 1994). According to Daily Trust (2013) in 2012 OPEC estimate, Libya has 48.5 billion barrels of oil reserve. However, in the real world, oil resources are finite and experiences have shown oil price to be volatile and the demand fluctuates considerably. Whatever happens to oil today is reflected in the Libyan economy tomorrow as a consequence of over-dependence on oil income to finance almost all development projects (Mazar, 2012).

The combination of unstable income from a finite resources, monopoly and over-dependence as the major source of wealth, and volatilities have placed Libya, together with many resource-rich developing countries, under pressure to diversify their economies over the last 50 years. This is in view of the argument put by some scholars (such as, Herzer and Nowak-Lehmann, 2006; Hesse, 2008; Matadeen, 2011) that there is a positive correlation between resource abundance, export diversification, economic growth and development. Economic diversification is, however, not a new strategy in Libya - it has been on the development plans since the 1950s when the country began to heavily depend on hydrocarbon production – but it has not focused on sectors with productive and competitive potentials. That is why a World Bank (2015:1) country overview of Libya up to the post-conflict period observes: "there has been no progress in formulating a strategy to stimulate the non-oil economy and put in place the building blocks for sustainable, diversified, private sector-led economic growth". Since the oil industry has superseded agriculture and other non-oil sectors, Libya has become a single commodity economy and extremely undiversified (Edwik, 2007; Mazar, 2012). Until there is some diversification strategy over how to manage the oil sector for development, the future outlook for Libya is distinctly bleak.

The question is why has the Libyan economy failed to achieve economic development despite the presence of huge oil revenues? There is documented evidence showing Libya lagging behind in translating oil wealth into economic prosperity and productivity – a symptom of Dutch disease and the resource curse. The flow of oil revenue led to the emergence of the so-called '*Dutch disease*' (Mazar, 2012, Ali, 2011; International Monetary Fund, 2013). The concept of Dutch Disease was coined by the Economist magazine in 1977 referring to the Netherlands gas boom. The Dutch Disease hypothesis posits that a boom in the natural resource sector shrinks manufacturing and other tradable sectors through crowding out, and an appreciation of the real exchange rate could have harmful long-term economic consequences (Smith, 2014; Krugman, 1987; Matsuyama, 1992; Ross, 1999; Torvik, 2001). Oil revenues have become a 'curse' to the Libyan state instead of being a blessing (Al-Sabah, 2011; Boduszyñski and Pickard, 2013; Kuru, 2002; Li, 2013). The resource curse or the 'paradox of plenty' can be traced back to Richard Auty (1993), which he describe as: "the puzzling paradox suggesting that resource-rich countries tend to grow more slowly than resource-poor ones'' (Brunnschweiler and Bulte, 2008:248). The resource curse theory offers a diverse set of explanations covering, amongst others, Dutch disease, terms of trade effects, debt overhang, human rights violation, internal conflict, institutional quality, corruption and rent-seeking behaviour (Neumayer, 2004). An excessive reliance on oil makes Libya a rentier state (Li, 2013). Rosser (2001) cites Beblawi (1987:329) view rentier state as "one where the rents are paid by foreign actors, where they accrue directly to the state, and where only a few are engaged in the generation of this rent (wealth), the majority being only involved in the distribution or utilisation of it". According to the Anti-corruption Resource Centre (2012), in Middle East and North African (MENA) countries, oil revenue has worked to undermine state institutions. For example, the Libyan government spent huge amounts of money on development plans, especially on agriculture and adopted strategies which focused on achieving food self-sufficiency and reducing the role of oil. These strategies were practiced from 1969 to 2011; however, the results were disappointing for many reasons – no productivity, no food security and lack of self-sufficiency in food (Mazar, 2012). Chapter two contains an extensive literature review relating to the failure of Libyan economy to translate her comparative advantage into prosperity.

A search for solutions to the above economic problems highlights the significance of economic diversification for the Libyan economy (Edwik, 2007; Mazar, 2012). The discovery of natural resources should not be seen as a means to abandon other relevant and important sectors of the economy, a diversified economy increases investment in the economy as more and more sectors of the economy are brought into focus with widening economic activities (Bature, 2013). According to Thomson (2011), economic diversification allows more consistent economic performance despite a change of circumstances and economic volatility whether local or global. Instead of the current practice of increasing a high share of resource rents abroad or spending it in other ways that locks the country in resource dependence, this thesis argues for an investment in domestic economic diversification strategy in the non-oil traded sectors, particularly fisheries. For example, agriculture (including fisheries) and other tradable sectors used to sustain Libya's economy but it began a rapid decline due to petroleum development, and over the years, its contribution to GDP continues to shrink from 9.5 per cent in 1962 to 2.5 per cent in 2010 (Mazar,2012;Sheibani, 2008). Unlike agriculture, which directly or indirectly employs more than 70 per cent of labour, oil production accounts for only

0.6 per cent of total employment in Libya (Abuhadra and Ajaali, 2014). As strongly argued by Porter (1998) any sector or industry which participates in the shaping of the structure of the economy must have the competitive advantage to be able to participate effectively in economic growth and development. There are benefits that could arise from developing the productivity sectors including an increase in trade (domestic and foreign), higher productivity of capital and labour, and better regional economic integration.

In search for answers within this context, this thesis examines why the Libyan economy failed to achieve economic development despite the presence of huge oil revenues (Mazar, 2012; Sakala and Kolster, 2013). Specific attention was paid on the fisheries sector considered to be a promising sector that is not fully exploited (Anabtawi, 1960; Clark, 1963; Porter and Yergin, 2006; Otman, and Karaberg, 2007). Furthermore, some studies and government documents confirm that the contribution of the fisheries sector in the Libyan economy is weak and negligible (e.g. Al houny, 1995; National Foundation for Maritime Investment, 2005; Alaerg, 2007; Al arifi, 2008). The overall questions of this research study are: Why is the contribution of the fisheries sector weak in the GDP; and how can the fisheries sector contribute to the diversification of nation's economic resources? This thesis explores the ability of the fisheries sector in Libya to participate in the diversification of the Libyan economy and food security. To this end, the theory of competitive advantage (Porter, 1998) stands out as being particularly robust tool that can lead to understanding how to make fisheries productive and competitive. Porter (1998: xi), in his book, *The Competitive Advantage of Nations*, attempts to answer the question with which he opened his book: "Why do some social groups, economic institutions, and nations advance and prosper?"

Competitive advantage theory is built on the assumption that a nation's competitiveness depends on how well human, capital, and natural resources are utilised and the capacity of its industry to innovate and upgrade, which means creating and sustaining superior performance (Porter, 1998). One of the ways that is widely applied to investigate industries competitive advantages is through the use of Porter's diamond model (PDM) (Nan and Lei, 2013). Porter's diamond model consist of ***four*** main determinants of national advantage (factor conditions, demand conditions, related industries and industry support and the company's strategy, structure and nature of competition) and ***two*** assistant determinants (government and chance). The model as a system shows that these determinants do not work in a unidirectional manner or individually but operate interdependently and mutually affect each other. Each determinant has common relationships with the others; at every stage each one has an influence on the other, which strengthens or weakens each determinant. Porter's diamond model has been chosen to investigate the fisheries sector in the eastern region of Libya because the model helps policy makers in their practical application of how to develop sectors with competitive advantage over their rivals in global competition. Libyan government cannot own and be responsible for everything as it was in the past. Government's role has to change from an owner of all productive and services sector to allow robust private sector participation, and to eliminate of the artificial walls in the economy. This raises further concerns about the ability of government and institutions to develop the non-oil sector.

This kind of study that examines and provide answers to the above questions will contribute to advancing knowledge of how resource-rich countries can become productive and develop other non-oil sectors, particularly those that have competitive value, in prevailing situations. It will also demonstrate the applicability of PDM in Libya in the context of the developing world and the countries of MENA within the context of the region itself.

It would not be too premature and out of context from the outset to briefly draw key characteristics of the country in which the study is based – a detailed historical account of Libya is contained in chapter three. Table 1.1 shows brief socio-economic information about Libya. Libya has a considerable endowment of oil and gas deposits and their exploitation has led significant demographic transformation – from just above one million in the 1960s to over six million as at 2010, out of which over 70 per cent live in urbanised areas. Approximately 97% of indigenous Libyans are predominantly Arab, Berber, or a mixture of both. As can be seen in sections 3.1 to 3.3, throughout their history, Libyans have been strongly influenced by a subsistence economy as a result of their harsh, arid climate. Nevertheless oil discovery, agriculture and fisheries, local industry, mining and commerce are some of the primitive sectors that provide employment opportunities to particularly rural dwellers. The migrants from Northern Africa (e.g. Egypt, Algeria and Tunisia), sub-Saharan Africa (e.g. Niger, Chad, Mali and Sudan) and from the rest part of the world are more than one million out of the 6.3

million population estimate. Migrant population form part of the labour force that work in the petroleum industry and the fast-growing services and construction industries.

Table 1.1: Key socio-economic indicators of Libya

Indicator	
Population	6.3 million (2010 est.)
GDP - per capita (PPP)	$24,700 (2012 est.)
GDP	$49.34 billion (2014 est.)
Ethnic groups	Arab and Berber 97%, other 3% (includes Greeks, Maltese, Italian , Egyptians, Pakistanis, Turks, Indians, and Tunisians)
Languages	Arabic (official), Italian and English (all widely understood in the major cities); Berber (Nafusi, Ghadamis, Suknah, Awjilah, Tamasheq)
Geography - note Climate	More than 90% of the country is desert or semi desert Mediterranean along coast; dry, extreme desert interior
Natural resources	Petroleum, natural gas, gypsum
Land use	Arable land: 0.98% & permanent crops: 0.19%& other: 98.83% (2012 est.)
Freshwater withdrawal (domestic/industrial/agricultural)	Total: 4.33 cu km/yr. (14%/3%/83%) Per capita: 796.1 cu m/yr. (2000)
Natural hazards	Hot, dry, dust-laden ghibli is a southern wind lasting one to four days in spring and fall; dust storms, sandstorms
Environment - current issues	Desertification; limited natural freshwater resources

Source: The World Factbook (2014).

1.2 The History and Motivations for Conducting This Study

The researcher of this study is a Libyan national. She is a Lecturer at the Faculty of Economics, Omar Mukhtar University. She has a Bachelor's degree in Agricultural Economics and a Master degree in Agricultural Economics. For someone who was born and raised in Libya, it is obvious to know that both individual livelihood and national economy are shaped by only two things: oil and government. The recent crisis is a manifestation of the effect of oil as the drop in oil production has serious consequences for the well-being of Libyan society. The current unfolding situation in the country can be traceable to its autocratic government. Given this view, how is it possible to envisage strengthen productive sectors other than that of oil, and changing the roles for government different from those of the past 40 years? As an economist passionate about productivity and development, the researcher has realised that due to the natural obstacles facing agricultural sector in Libya - a desert climate and the lack of agricultural land - most agricultural researches at the university focuses on crop and orchard production, soil science and animal husbandry. Despite the length of the Libyan coast and its fish stock potentials, scientific research in fisheries is neglected. That is why the researcher took up the challenge to undertake research in fisheries. Based on the above background, the researcher holds many questions in mind as I write my current thesis. First of all is to make understand the potential of the sector and integrate it to the national structure of the economy. Secondly is to find the appropriate and suitable model that can be adaptable to Libya's situation. After an extensive literature survey, one of the models of the theory of competitive advantage, known as the Diamond model, developed by Michael Porter (1985) is the choice model that could meet this task. Lastly, the researcher consider the evaluation of Libyan fisheries using the above model as timely, particularly as the country is currently undergoing a post-war economic and political reconstruction. My thesis offers a holistic picture of fisheries sector and can be used as justification for selection as a good candidate for post-war economic diversification and development of Libya.

1.3 Justification of Conceptual Approaches

A range of theories of economic development are at hand to help policy makers in their quest to promote economic growth in particular sectors of the economy or in particular regions; some more immediately applicable and practicable than others. One of these theories is the competitive advantage theory. This theory, according to Peng (2009:125) is one of the most recent and "it is the first multilevel theory to realistically connect firms, industries and nations, whereas previous theories only work on one or two dimensions". In the choice of competitive advantage models available to policy makers, Porter's diamond model stands out as being particularly robust and obviously orientated towards implementation of concrete policies on ground. Why does Porter's Diamond Model stand out?

First, the model has been tested and is widely adapted by policy makers all over the world (e.g Porter,1998, Barbe and Triay ,2011; Bashiri et al., 2013, Khanani 2014) because it is in reduced form, diagrammatic, and (unlike many alternative academic models) do not depend on complex mathematics or subtle assumptions. According to Smit (2010), the diamond has stimulated great academic discourse in most international business textbooks. In short, the model describes the key elements and interactions needed for industry clusters to be successful, or achieve so called 'competitive advantage'. Secondly, Cho and Moon (2013) in their book, *From Adam Smith to Michael Porter: Evolution of Competitiveness Theory*, acknowledge that Michael Porter is one of the world's most influential thinkers on management and competitiveness. This is because Porter's model explained the complication of global economy as against the explanation made by the traditional trade theories. While some model proponents simply argue without providing any analytical framework, PDM uses well-defined models that are simple to adopt and use in solving problem or understanding a sectors potential for competitiveness – an approach that is quite limited in traditional theories. Porter's use of models to demonstrate different choices of creating wealth, according to Cho and Moon (2013), has made him an authority in the field of modern business, value creation and in creating choices for national prosperity. Thirdly, Porter's modern economic background cuts across economics, business administration, science and engineering to provide comprehensive solution to modern business. This diverse background has helped Porter to view, analyse and provide useful insights into modern business. Thus, Porter's model not only provides basic understanding of competitiveness, it is also configured to be applied to a variety of industries in different countries over a long period of time. PDM has also been extended by several scholars in individual, corporate, industrial and national competitiveness of firms and sectors such as agriculture (see more examples in chapter five).

For these reasons, the style of the model immediately facilitates practical understanding and implementation. The researcher believes that the ideology of competitive advantage is crucial to the advancement of productive sectors in developing countries dominated by a finite sector, such as oil. Competitive advantage theory touches the core economic problem in resource-rich developing countries which is lack of productive sectors. For the case of the Libya, this thesis applies Porter's 'Diamond' model to the context of Libyan fisheries. It has provided a model for a holistic analysis of the Libyan fisheries, which is currently under-developed and sitting in the shadow of overriding oil sector. This model is very suitable and more valuable at this time of Libya's no choice to diversify the economy and attain food security and self-sufficiency. In this case, the model first suggests making the industry more competitive domestically to achieve food security taking into account the demand side before considering the highly sophisticating export market. As it has been widely established in section 4.7 that fish consumption is very low in Libya compared to neighbouring countries, the Shepherd model was used to understand the relative importance of different types of factors that affects consumers' behaviour toward fish consumption. The model developed by Shepherd (1985) has been chosen for the current study to produce fish consumption behaviour. This model was useful in understanding why the demand for fish is low and how the demand factors identified by Shepherd's model can be integrated with Libyan fish consumption to increase local demand.

1.4 Motivations, Expectations and Steps for Accomplishing Research

As for the current research, the researcher's motivation grew from the following reasons:

1. The main motivation is to gain advanced knowledge in this discipline and to make a contribution to knowledge. This is due to the researcher's interest in the subject of the challenges facing the resource-rich developing countries; particularly how developing countries like Libya can drastically reduce excessive dependence on oil and use excess crude rent to finance the non-oil sectors, whose potentials are massive and can create wealth.
2. A number of literature that the researcher has encountered show the lack of research in understanding the effect of Libyan political system in fisheries sector at both organisational and individual levels. The current study investigated the impact of the political system on the fisheries sector. It specifically sought to establish whether the Libya government ideology was activating or inhibiting its fisheries sector. Recommendations arisen from the study could help policymakers to identify and understand the strengths, weaknesses and opportunities in fisheries development.
3. Whilst this study applies Porter's diamond model in fisheries as a non-oil sector in a country that is bedevilled by the resource curse, it also contribute to the literature about the appropriateness of the application Porter's diamond model on sectors and industries, particularly in resource-rich the developing countries.
4. The researcher has seen how government runs agriculture in Libya. The researcher believes that undertaken research could change the way government of Libya participate or dominate the economy is worthwhile. Using the diamond model contributes to the debate about the role of governments in diamond model.

5. Considering the hardship Libya was exposed to during the 2008 economic recession, the Libyan government provided the opportunity and encouragement to undertake this kind of study which focuses on the productive sectors.

Some major activities were undertaken from infancy stage of the thesis to the point of accomplishing the research aim and objectives and in answering the research questions. For example, the researcher studied seven modules on research methodology (Survey Method 1, 2, 3; Qualitative Research 1 and 2; Philosophies of Research 1 and 2). In the first and second years the researcher has attended modules that could help the researcher to design interviews and questionnaire, and it improved the researcher's skill to analyse quantitative and qualitative data. At the end of these modules, she was able to design questionnaires and interviews that are suitable for addressing the research issues at hand. These questions were reviewed and approved by supervision team and experts.

In the second year (2011), the researcher conducted a Pilot study. This was to ensure the clarity of the questions, check their duration and presentation, and what the possible response would be. The Preliminary findings from the pilot study shows three reasons for the weakness of this sector:

a) Lack of regulation of foreign trade is one of strongest reasons for the ineffectiveness of fishery sector in Libyan economy.
b) Fish price is a significant factor affecting fish consumption.
c) There is a wide gap between government policy and what the workers in fisheries sector actually need.

After the pilot study, there were no significant changes made in the questionnaires or interviews questions. On the whole, the pilot survey also served to minimise error.

In 2012, the researcher participated in abstract and electronic poster presentation at the 6th World Fisheries Congress which took place in Edinburgh from the 7th-11th May 2012 (see Appendix A). She has also attended CSAE (Centre for the Study of African Economies) Conference for two consecutive years, 2013 and 2014 (see Appendix B). In particular, the conference theme of 'Economic Development in Africa' held at St Catherine's College, Oxford, has further sharpened the researcher's understanding of the economies of African resource-rich developing countries, as well as the impact of the political system on the economy. The information that the researcher has gathered during this conference has helped to explore the position of Libyan economy between these economies, and the role oil played in the non-appearance of the rest of the sectors (see chapter two for some details). In 2013, she met Alan Gelb as part of her networking during the CSAE Conference. Alan Gelb is a senior fellow at the Centre for Global Development. His recent research includes the special development challenges of resource-rich countries, aid and development outcomes, transition from planned to market economies, the development applications of biometric ID technology among other research interests[1]. Alan generously spared nearly three hours of his time for discussion about this research and the appropriateness of the researcher's theoretical and conceptual approaches. This meeting deepened the researcher's resolve to focus on fisheries sector in the Libyan economy in order to diversify from oil. The next section (1.5) consists of a discussion of fishery issues in Libya.

1.5 Fisheries in Libya

Studies concerned with Libya's fisheries sector suggest the following. At first, the value of production requirements and fishermen's experience are important factors affecting the quantity of fish that is produced. This suggestion was made by Alaerg (2007) who examined the efficiency of the Libyan fishing fleet by using simple and multiple regression analysis. The study recommended improving the quality and credibility of statistical data to reduce reliance on estimates in the calculation of economic and social variables. Secondly, there is a good environment for the growth of fish. Al-arifi, (2008) made this observation when he undertook a study of the components of, and geographical constraints on, fish production in the eastern part of the Libyan coast. He found that the diversity of the seabed - consisting of rock, sand, clay, herbaceous and slots of valleys that carry the water to the sea with dissolved foodstuffs - is a good environment for breeding fish. He also states that areas suitable for fishing in the eastern region exist along the length of the coast but are severely hampered by a shortage and high prices of boats, equipment and labour. The most important factors that affect negatively the demand are high prices and the culture of the housewife – for example, Egyptians consume fish more regularly than Libyans as a result of cultural differences and the Egyptians long established traditions relating to fish consumption. Thirdly, Al houny (1995) pointed out that fish quantity was low from the early 1950s until the early 1990s. He recommended that fish production should be stimulated and increased gradually, and that this gradual increase should come from coastal fishing by catching surface fish and by the limited use of jarfat fleets. This should continue until a comprehensive programme of surveys to estimate the fish stock is implemented.

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[1] Centre for Global Development http://www.cgdev.org/expert/alan-gelb

The rest of the studies are mostly focused on the nature and geography of the Libyan coast (Abu medina 1995; Ahalioa, 1998; Gilani, 2001) and the degree of pollution and industrial waste in Libyan waters (Hweihi, 1982; -Hamouda and Wilson, 1989; ELfallah and Boargob, 2005). However, all these studies confirmed the presence of contamination or pollution in Libyan coastal waters to varying degrees due to pollution generated at different phases of oil operation, leakages from ships and pipelines, sewage or industrial waste. Other studies conducted surveys on the boats of the fishing fleet, ports and fishing harbours (see, for example, Abu khadir and Al zarqaani, 2005; Alzkose, 2006). The marine surveys are usually carried out by the Marine Biology Research Centre in Tajurae - with the cooperation of regional organisations such as GFCM or Copemed - in order to develop a database for economic and social aspects of the fishing industry. Currently, the fisheries sector suffers from lack of a comprehensive survey of fish stock estimate (Alaerg, 2007).

There is also limited study of fish production, distribution and consumption and its connection to the overall economy of Libya. This study aims to fill the gap by examining the fisheries sector as a diversification strategy from the dominant oil sector by applying Porter's diamond model. The unique approach of using the diamond model for the collection of fisheries information makes available an analytical approach for understanding the true state of the sector and what to do to make it work. Libyan fisheries resources, when properly managed and sustainably exploited can be used for import substitution, create employment, reduce poverty and help in the attainment of food self-sufficiency.

1.6 Development and Prospects of Fisheries in Libya

With an estimated abundant fish coastline of 1,970 kilometres, a shelf area of 53,243 square kilometres and a claimed Exclusive Economic Zone (EEZ) of more than 355,590 square kilometres (Milanese el at., 2008). "Libya has the longest Mediterranean coast of any Middle Eastern country and strategically is well placed to influence central Mediterranean traffic" Anderson, (2013:336). It should gain from a promising productive fisheries sector, as do other Middle East countries neighbouring the Mediterranean Sea (Aboligma and Gzeery, 1997). However, the Libyan government has not focused tangible attention on fisheries as a source of income or as a means of deriving protein for the nation's diet through fish production (see chapter three for further details). As already indicated in section 1.1, the Libyan economy is by far dominated and squarely dependent on the petroleum industry. Other important sectors of the economy, such as fishery activities, have over the years been affected by the Dutch-disease syndrome. Consequently, a neglect of the fisheries sector in general emerged and it is not addressed in many of the development plans (see chapter three for details).

Figure 1.1 shows Libya's coastal province and the four ports (Benghazi, Sousse, Darna and Tubrek) in the eastern coastline where the fieldwork was conducted. Fishing activity in Libya is categorised into coastal fishing (around the east, west and the Gulf of Sirte), Lampara fishing (around the west coast - catching mackerel and sardines by using lights), bottom trawling, tuna fishing with seines, long lining, and Tunaras. Each of these comprises different fish species (see, Shakman and Kinzelbach, 2007 for inventory on Libyan fish species) and fishing methods (Lamboeuf, 2000). For example, the study by Lamboeuf (2000) found a total of 1,866 artisanal fishing vessels in Libya, representing 92.5 per cent of the sector. While artisanal fishermen require a minimal capital investment on inputs and utilise small canoes or planked boats of different sizes, large fishing industry is low due to low support from the government. The fishing industries, even though largely private, are generally weak. In 2005, Libya declared a fisheries protection zone (FPZ) to establish and protect marine areas.

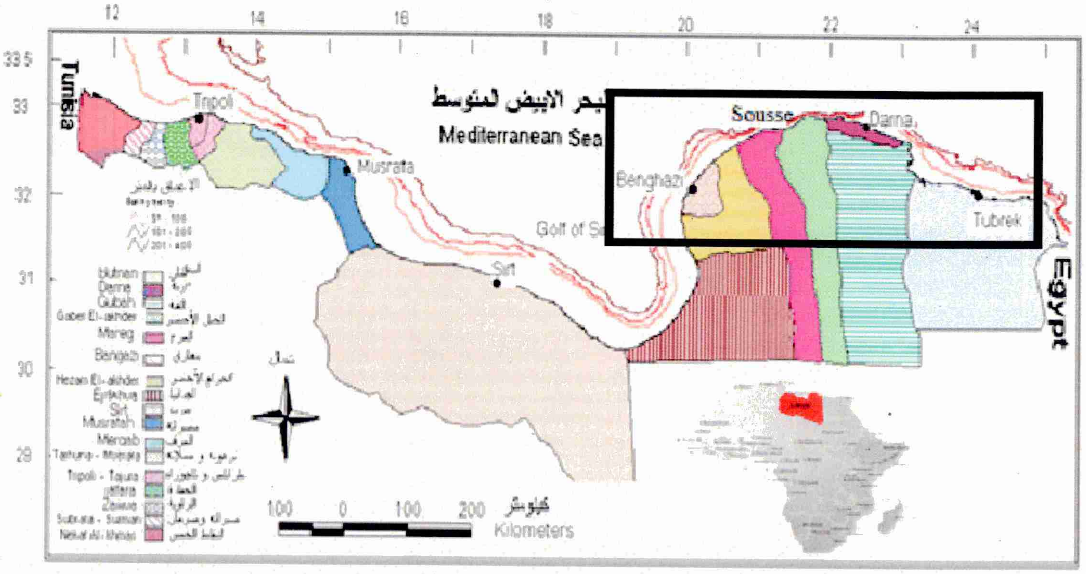
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Figure 1.1: Map showing Libya's coastal areas for large-scale fishing.
Source: Further modified by the researcher from Antipolis (2002:3)

Fisheries-related activity is very limited and the benefit from fisheries is very poor relative to its huge potential. The sector hardly makes a contribution to the GDP and in supporting food security. Between 1970 and 2010 annual fish production never exceeded 40,000 tonnes (General Authority of Marine Wealth, 2011). While the coastal areas of Tripoli, Benghazi, Misrata, Az -Zawiya, Al Bayda, Zliten and Darnah are host to approximately 90 per cent of Libya's 6.3 million population, table 1.2 shows that the average fresh fish consumption per capita in Libya is 6.4 kg/year. This per capita fish consumption is low compared to the world average per capita consumption of 19.2 kg and 11.2 kg in the Arab region (AOAD, 2013). Overall, Libya is a net importer of fish and fishery products – importing about 46,890 tonnes and exporting 2.32 tonnes of fish in the period 2009-2011 (AOAD, 2012). According to FAO (2011:11), "despite 1,970 km of coast and a potential for growth, fishing activities are limited with most of the fish products consumed domestically". In order to increase the average per capita consumption and to reduce imports, the opportunities offered by the fisheries sector needs to be fully harnessed.

Table 1.2: Fisheries and the Libyan Economy (1990-2010)

Statement	2010
Fish consumption (as weight per inhabitant)* kg/year	6.4 kg per capita./2007
Commercial balance (million $)	-39.7
Fish employment (%) inside the agriculture	0.99
National employment (%)	25.55
Contribution of agriculture and fisheries sector to GDP (%)	2.98

Source: Marine Research Centre (2000); Unified Arab Economic Report (2010); National Foundation for Maritime Investment (2005); Abu khadir and AL Zarqaani (2009); FAO (1995); Alaerg (2007).
Fish consumption (per capita) kg/year = Apparent consumption (production + import - export)/Population

The fisheries statistics of FAO indicate that this sector's contribution was a mere one per cent of employment of the total national labour force and if considered as agricultural output, only nine per cent (FAO, 2005). This is because the majority of fishing is carried out on a very small-scale and is not well-developed. In eastern Libya, artisanal fisheries that operate on a small-scale are the most important source for the local markets. As fisheries of this type are informal, operate on a small-scale, and lack access to capital, it becomes difficult for them to fully exploit business opportunities as advocated by Porter. However, substantial progress for improving the sector has been undertaken since the 1990s such as investments in port construction (Al-Arbah, 1996), but Libyan fisheries still perform well below their real potential. Why is this case and how can this situation be addressed is established in chapters eight, nine, ten and eleven.

The fish industry contributes to the economy of some Middle East and North Africa (MENA) countries. Feidi (2013) indicate that the MENA region produce 3.5 million tonnes of marine and fresh water capture fishes. While Egypt depends on its oil and natural gas for economic prosperity, it is also a major producer of farmed fish, with one million tonnes in 2007. Other major producers such as Morocco with 894,000 tonnes. Overall, this figure is too low considering the total shorelines of these countries (about 23,000 km in total) and their continental shelf area (about 707,000 km2), coupled with oceans, seas and gulfs that surround them. However, AOAD (2013) indicates that in 2012, fish exports from the Arab world is worth US$2.45 billion. Figure 1.2 below indicates that Morocco now controls 60 per cent of the Arab fish export market, while Libya is a net-importer of fish from the European Union.

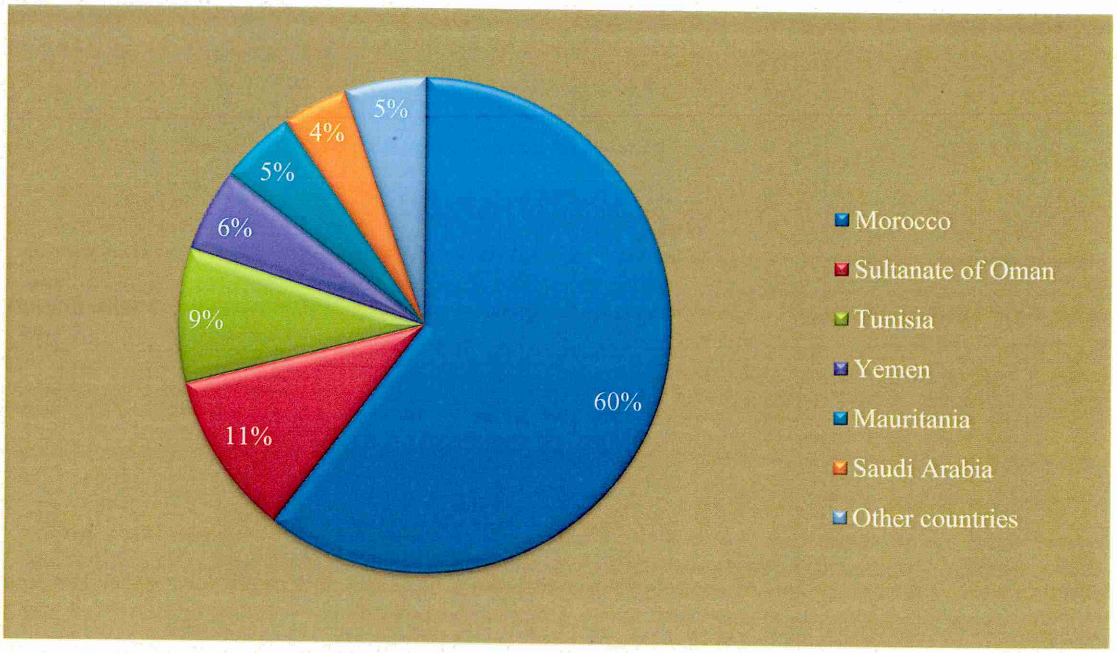

Figure 1.2: Fish Exports from the Arab World in 2012.
Source: Arab Agricultural Statistics Yearbook, AOAD.

Fish production in Libya is very low compared to the countries contained in figure 1.3. It is clear that Libya ranks last in terms of fish production, below Egypt, Tunisia, Algeria, Morocco and Mauritania. Indeed, fish production in Libya is very low by a large margin. Tunisia, with its relatively short coastline compared to Libya, produced more than four times the Libyan annual output during the same period. For example, in 2010 fish production in Tunisia reached 108,000 tonne while in Libya it did not exceed 22,604 tonnes. In addition, there is no comparison in terms of fish production between Libya and its neighbour, Egypt, where in 2010 fish production stood at 1,170, 000 tonnes. The small producers, but with a shorter shoreline, include Palestine with 2,702 tonnes, Jordan with 1,015 tonnes and Djibouti with only 265 tonnes (Feidi, 2009).

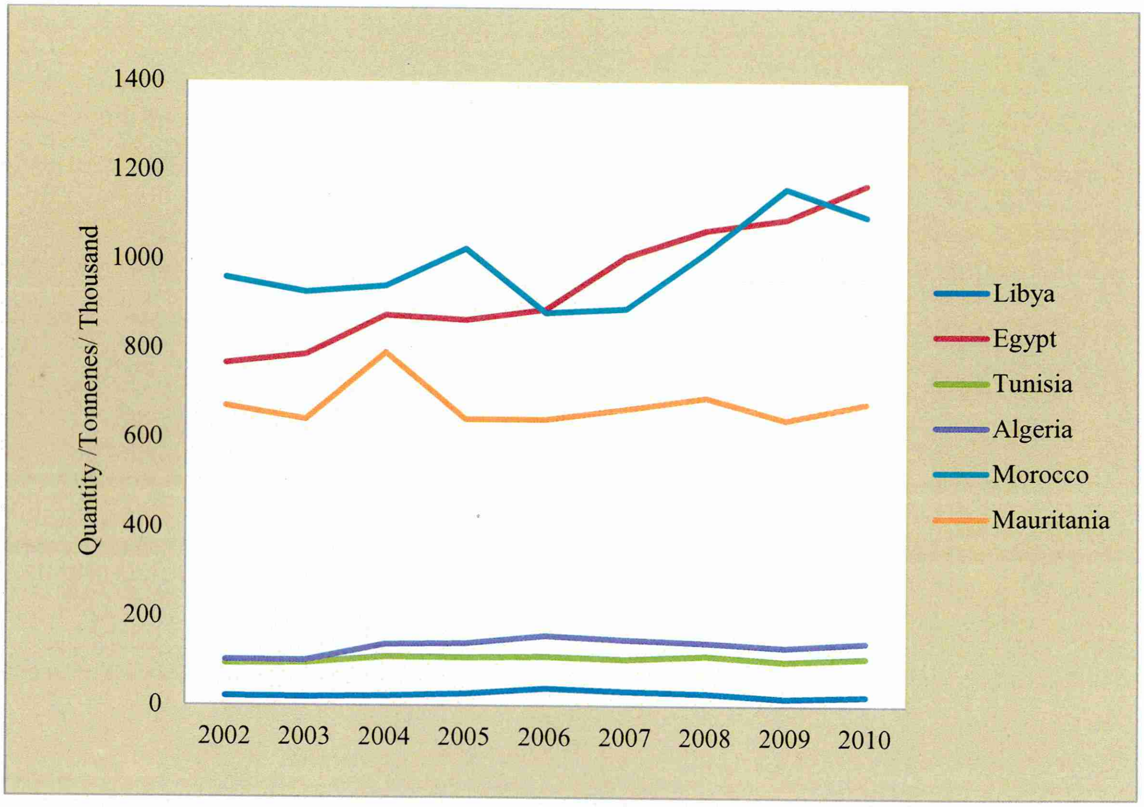

Figure 1.3: A Comparison of the Quantities of Fish Production between some Arab Countries.
Source: National Foundation for Maritime Investment (2005); General Authority of Marine Wealth (2000); FAO (2010); Unified Arab Economic Report (2011).

1.7 Major Challenges Facing Fisheries Development in Libya

Section 1.4 has shown that Libya's fishing industry is underdeveloped, unindustrialised, unutilised and therefore unable to make a meaningful contribution to the national economy (see chapter 3). The majority of problems encountered by the Libyan fisheries sector, ranging from low production, low export, low consumption, institutional instability to insufficient financial allocation, are discussed in this thesis. Apart from these external problems, there is a general lack of effective control of funds of the business.

1.7.1 Low fish export

Countries are now using export as a strategy to benefit from the international markets. Whilst the fisheries potential is high, Libya faces obstacles and barriers in terms of foreign trade and the export market for fish. At some point in 2009, Libya's fish export was almost 800 tonnes, while in the same year Tunisia's fish export reached 23,000 tonnes (Arab Monetary Fund, 2011). Just two years later, Libya imported 15.63 thousand tonnes of fish to meet local consumption and exported 0.78 tonnes. This means nearly half of the fish consumed by this population is imported (Arab Organization for Agricultural Development, AOAD, 2011; 2012). The question that arises here is: What is the quality of the fish being imported? Among Libya's agricultural products, fishery has the comparative advantage in production for local consumption and export. Why is Libya not able to grow and develop its own local fish industry? With regards to export, what are the barriers that prevent the Libyan state from exporting fish to neighbouring countries as well as the international market? The answers to these questions are addressed and discussed in subsequent chapters.

1.7.2 Low fish consumption

It is interesting that despite Libya's location on the long coastline of the Mediterranean Sea, average fish consumption is very low, not exceeding 6.4 kg per year (Alaerg , 2007), unlike neighbouring states—for example, the average fish consumption for Egyptian people in 2012 was 16.8 kg annually (Badawi, 2012). Porter's diamond model, as applied to the fisheries sector in this study, confirms that domestic demand creates a competitive advantage. In other words, the presence of strong local rivals who manage to understand, reach and satisfy the consumer raises the efficiency of the industry and enables it to compete internationally (Porter, 1998). As Libya appears to have a small market for fish (Al-arifi, 2008), the small domestic fish market can only promote low economic growth. In these circumstances, fisheries have to look for export possibilities to sustain the economy. The fishing industry is an industry that should grow, to at least provide Libyans with the protein needed to boost food quality and well-being, at least; we know that consumption of fish is healthy. This means the development and growth of the fisheries sector will help achieve food security, and the stability of food security will alleviate the threat of external shocks. Therefore, two questions that require answers are: what are the factors that affect local fish demand in Libya? And what is the current status of local fish marketing? The reasons gathered through case study approach (chapter 7) are presented and discussed in chapters 8-11.

1.7.3 Institutional instability

According to the National Foundation for Maritime Investment (2005), the administration of the marine sector suffers from instability of policies and programmes. This has impacted negatively on the outcome of this sector. The report also pointed to the weakness of the institutions responsible for financing the sector, difficult credit conditions in addition to the weakness of institutions are responsible for the preparation and training, and qualification of cadres specialised in the field of marine resources. Despite the Libyan government's pretension to institute a socialist system, the Libyan state is in fact a centralised government (Mazar, 2012); this means that the government is responsible for any change in the fisheries sector. Therefore, the structure and strategy of the administration is the government's responsibility. The question that needs answering is: To what extent does the management of fishery, legislation and regulations issued by the government help the development of the fisheries sector? This is in line with Porter's (1990:87) statement that government should primarily be: "a catalyst and challenger; [...] to encourage - or even push - companies to raise their aspirations and move to higher levels of competitive performance ..."

1.7.4 Insufficient financial allocations to marine resources sector

Despite Libya's massive oil revenue, allocations to the fisheries sector in development plans are very low. There is a neglect of the marine resources in general - it has not been addressed in many of the development plans. Allocations did not exceed 0.55% of the total allocations for the four decades after 1970 (National Foundation for Maritime Investment, 2005). The reason for government's refusal to fund fishing is not far-fetched from government of Libya's guilt of financial and administrative corruption (Rheannon, 2011). With Libya's small population in relation to its huge oil wealth, corruption and wastage in public institutions have limited oil sector revenue from reaching other sectors where it would benefit the people and sustain the economy (Mazar, 2012). These governance issues and financial allocation can strongly influence the competitiveness of the fisheries development. The question that is of concern here is: Does the fisheries sector receives enough funding, or is financial corruption and laxity in the fisheries behind its current state of underdevelopment?

1.8 Research Questions

As a result of the challenges faced by fisheries sector and its current state identified in section 1.7, the research questions were developed to enable the researcher to investigate and examine all the determinants of the diamond model. The first question investigates factor conditions; the second question is about related factors supporting fish industries. The third and fourth questions deal with demand conditions both domestically and internationally. The last question is concerned with the following determinants: the role of government, structure and strategy, and industrial rivalry. These are:

1. What factors affect fish production in Libya?
2. What is the current situation of related supporting fish industries?
3. What are the factors that affect local fish demand in Libya? And: What is the current status of local fish marketing?
4. What are the barriers that prevent the Libyan state from exporting fish to neighbouring countries as well as the international market?
5. To what extent does the management of fishery, legislation and regulations issued by the government help the development of the fisheries sector?

These questions were deduced after reflection on both the current situation of the Libyan economy and the fisheries sector. In order to answer these research questions and to achieve the research purpose, certain aims and objectives are set to accomplishment this study as stated in the following section.

1.9 Research Aim and Objectives

Fishery is one of the development areas and it could be an important economic sector in Libya. Although it has some problems, the competitive advantage theory offers great hope that many industries will be able to develop by transforming their disadvantages into advantages. This research explored competitive components that reduce the costs of the fishing business; strengthen the linkages and integration of the fishing economy with the local and regional economy, especially with neighbouring and European markets; strengthen support for technical and business management skills thereby improving productivity and harvest; and improve access to finance for micro, small, medium and large-scale fishing. It is anticipated that competitive advantages will allow the Libyan fish industry to play an important role in economic diversification and support domestic consumption needs and produce surpluses for export. The primary aim of this research is to *explore the strengths, weaknesses and opportunities of the fisheries sector in the eastern region of Libya and its ability to achieve competitive advantage for economic diversification*. To achieve this aim, the research formulates the following objectives:

1. To critically review the existing literature on resource abundance and development and to establish how Libya has failed to develop other sectors to diversify the economy.
2. To explore and assess the current status of fish production and related supporting fish industries in east Libya.
3. To study and assess the current status of fish demand, and identify incentives and barriers to fish consumption that affect consumers in the eastern region of Libya.
4. To explore the features of the foreign trade of fishery.
5. To examine the extent of government's participation and whether they meet producers or consumers' needs and expectations.

To achieve the above research objectives, a mixed methods research (qualitative and quantitative data collection) was adopted. Table 1.3 summarises the aim, objectives and the research methods adopted; however, there is considerable overlap in the data gathering techniques and the people interviewed during the fieldwork. Full details of the research methodology and justifications for their adoption are covered in chapter seven.

Table 1.3: Research aim, objectives and methods

Aim	Objectives	Methods					Mode Theor
		Literature	*Documents*	*Questionnaire*	*Interview*	*Visual Material (Photographs)*	
To *explore the strengths, weaknesses and opportunities of the fisheries sector in the eastern region of Libya and its ability to achieve competitive advantage for economic diversification.*	To critically review the existing literature on resource abundance and development and to establish how Libya has failed to develop other sectors to diversify the economy.	x	x				RC DD CA
	To explore and assess the current status of fish production and related supporting fish industries in east Libya.	x	x	x	x	x	PDM
	To study and assess the current status of fish demand, and identify incentives and barriers to fish consumption that affect consumers in the eastern region of Libya.	x	x	x	x	x	Shephe
	To explore the features of the foreign trade of fishery.		x		x		PDM
	To examine the extent of government's participation and whether they meet producers or consumers' needs and expectations.		x	x	x		PDM

*RC = Resource curse; * DD = Dutch Disease; CA = Competitive Advantage; PDM = Porter's Diamond Model.

1.10 Structure of the Thesis

The thesis is divided into twelve chapters along conventional lines of research; it starts with introduction and then move on to literature review of theoretical/conceptual background, including country analysis of the problem, followed by methods justification and data source issues, to more substantive/empirical findings and finally, the conclusion. The structure of each chapter is presented below.

Chapter One (General Background and Rationale for the Research Study) provides the general background and the rationale for the study. It also highlights the importance of fisheries and the problems fisheries are undergoing in Libya. The aims of the research, research questions and structure of the thesis are also presented.

Chapter Two (Resource Curse and Resource-Rich Developing Countries) examines the theoretical and empirical debates concerning the impact of oil revenues on the economic and socio-political development of developing countries with a view to situating Libya as a classical example, and indicates how the research builds on existing work. The literature highlighted in this chapter forms the backdrop against which the theoretical framework, data sourcing and analyses in proceeding chapters are undertaken.

Chapter Three (Historical Account of Libyan Economy and Food Self-Sufficiency) starts with a comprehensive historical analogy of the Libyan economy, including the various proposed economic development plans, right from pre-oil Monarchy rule through to dictatorial rule of Ghaddafi, to the 2011 crisis and up to date. In the second part of the chapter, attention was placed on the dwindling role of agriculture to the economy and how that has affected food security and self-sufficiency. Various analysis conducted shows that food gap exist in Libya and the chapter move on to argue for the use of fisheries sector as a potential candidate with strong competitive advantage for diversification and national food security and self-sufficiency.

Chapter Four (Libya Fish Potential, Production and Consumption) contains aspects of the product life-cycle of fisheries focusing attention on production, supply and consumption. An extension of this chapter covering fish value chain is in chapter six. This chapter indicate that fish is available in Libya, production rate is low and poor and consumption is the lowest in Maghreb. The analysis provided in this chapter is pinned to the analysis of PDM from chapter eight to ten.

Chapter Five (Analysing Competitive Advantage and Porter's Diamond Model in Relation to Libya's Fisheries Sector) reviews literature relating to theoretical and conceptual framework relating to national competitive advantage as sought for in this research. The first part of this chapter reviewed economic theories, starting from classical economic theories of growth through to modern economic theories of comparative advantages, and finally the competitive advantage theory. The second part focused on Porters diamond model which form the basis for this research's analysis of the determinants of competitiveness of fisheries sector in Libya. The third section of the chapter contains a review of food consumption habits, preferences and behaviour with particular emphasis on Shepherd's (1989) model. This model forms the conceptual framework for most of the demand factor analysis presented in chapter nine.

Chapter Six (Aspects of Fisheries Sector Value Chain) contains some aspects of the business of catching, handling, trading and consumption of fish using the fish value chain. The value chain captures Porter's (1998) related and industry support factors, particularly downstream related industries, which fish and fishery products must pass through to reach consumers (e.g. distribution, handling and marketing). Fish value chain results in a finished product that can boost local consumption demand and meet international market.

Chapter Seven (Methodology, Methods and Field Study) provides a justification and a description of the methodology and methods adopted in this research. It begins with literature survey of existing research methodology, paradigm, approaches, and techniques found used in social research. The chapter move on in detail to define and explain the research methods adopted in this study and how the strategy used in selecting the case study. The processes for data collection, such as the selection criteria, design and administering of questionnaires (both general and for Shepherd's model), the conduct of interviews, analysis and validity testing processes are contained in this chapter. Moreover, the chapter outlines ethical issues and limitations data involved in the case study.

Chapter Eight (Factor Conditions and Related Supporting Industries) combines and discusses the key theoretical and empirical findings of factor conditions and related supporting industries. The overarching issues discussed that emerged from documentary analysis and fieldwork have been categorised into physical resources, human resources, knowledge resources, capital resources and infrastructure, including fish canning factories, boat factories, fishing gear and ice factories. The strengths and weaknesses of these determinants are evaluated in developing fisheries into a competitive sector that would contribute to Libya's economic diversification.

Chapter Nine (Demand Conditions for Fish Demand in the Eastern Region of Libya) undertakes demand conditions' analysis. This chapter analysed the factors affecting local fish demand in the eastern region of Libya and the barriers that prevent the Libyan state from exporting fish to the neighbouring countries as well as the international market. This chapter reports mainly the size of fish demand and findings from Shepherd's model, which includes nature of buyer needs, and factors influencing fish consumption (focusing on the food itself, individual behaviour, and social, economic and environmental factors influencing consumption). Together with Porter's demand determinant, the chapter presents the real picture of fish demand in Libya.

Chapter Ten (Strategy, Structure and the Role of the Government in the Fisheries Sector) examines the role of the government in the development of the fisheries sector as well as the impact of the growth strategy of the fisheries sector industry in terms of the responsibility of government in the management of the sector. Taking this determinant into context, the chapter proposes a realignment of the role of government to make it a regulator as against an operator and by wider implications make it functional in the discharge of its responsibilities.

Chapter Eleven (Discussion) reports the main results, discusses the findings of the case study in relation to competitive advantage theory and the questions of the study. This chapter starts by presenting major findings revealed from Porter model six determinants of industry competitiveness. It then progresses to discuss the outcomes with specific examples drawn from the case study, neighbouring countries, MENA and the world at large. Based on the data discussion, this thesis argues for government role to be positive, direct and central in order to develop Libyan fisheries. The reasons for this conclusion are proffered in the concluding section of the chapter.

Chapter Twelve (Conclusions) is the last chapter of this thesis. The chapter links the research aim and the major findings of the research to present the conclusions and suggest possible areas for further/future research. The chapter also sheds light on the significance of the research and its contribution to knowledge in theory and in practice.

1.11 Summary

This chapter presents a brief introduction to the thesis and provided an overview of the research problems which consist of Libya's oil resources and its inability to use its oil wealth to power development and increase productivity of non-oil sectors. This chapter presented the motivation for undertaken research on fisheries and justification for the use of Porter's diamond model of national competitive advantage. It also includes a brief account of some factors hindering the growth of fisheries despite huge potential, and the research questions emanating from that brief account. The study aim and objectives was followed by a summary of the content of each of the twelve chapters in this thesis. The next chapter, which represents the first part of the literature process, pulls together the various propositions for oil-rich developing countries, including Libya, and their failure to stimulate economic and social development, thus setting the pace for diverting attention to agriculture, mainly fishing.

Chapter Two

Resource Curse and the Experience of Resource-Rich Developing Countries

2.0 Introduction

This chapter deals with features of the 'resource curse' that negatively affect the macroeconomic performance of oil-rich developing countries and hinder their economic development (Sachs and Warner, 1999, 2001) with a particular focus on Libya. It will also highlight the political, social and economic aspects of the resource curse theory and touch upon the notion of the 'rentier state'. Section 2.1 explains the resource curse phenomenon. Section 2.2 reviews the impact of the resource curse on the social, political and economic aspects of society. Section 2.3, presents lessons drawn from countries that have escaped from the resource curse such as Indonesia and South Africa. The Indonesian government barred the 'Dutch disease'; it also managed to implement security factors that attracted foreign investment; the policies and strategies they adopted are flexible, allowing for reform as necessary (PWC, 2012). The government of South Africa also managed to strengthen ties among the divers sectors. While designing its strategic plans, it endeavoured to support economic diversification. For each sector, the plans could outline the basic opportunities and constraints along with the main results and tasks required for the sector's development (United Nation and NEPAD-OECD Africa Investment Initiative 2010).

Ross (2013) pointed out that though the initial reference to the term 'resource curse' was published by Auty (1993), Adam Smith exposed the dangers of pursuing mineral wealth in the Wealth of Nations. According to him, among projects that are expensive and uncertain and that bring impoverishment to a larger portion of the population, nothing is more devastating than the search for new gold and silver mines. These projects are encouraged by wise law-givers and investors who are willing to increase the capital of their nation (Ross, 2013). The Libyan economy has all the manifestations of the resource curse highlighted by economists who have explored the phenomenon (Vandawella, 1998; Ross, 2001, Lam and Wantchekon, 2002; Frijters, 20101, Al-Sabah, 2011, Mazar, 2012, Li, 2013). As result, the economy is characterized by the negative effects of rich oil reserves.

Many economists (Vandewalle, 1998; Al-Sabah, 2011, Meijia, 2012; Mazar, 2012; Li, 2013) assert that Libya serves as a good example of resource curse theory due to the practices of the regime, the clear evidence of Dutch disease, price volatility and finally the philosophy and ideology of the leader. Libya`s economy primarily depends on oil and it impedes the development of other export sectors such as manufacturing; moreover, it nurtures rent-seeking and corruption (Li, 2013). Advancing Vasquez and Frijters (2011) this argument observed that Libya's major problem is a form of resources curse whereby incomes come mainly from oil and gas; they represent more than half of Libya's economy.

Particular attention is paid to the main features of a number of resource-rich developing countries especially oil exporters like Libya which have been identified as casualties of the resource curse. Similar situations exist in the majority of resource-rich developing countries, though not all face the challenge of transforming their natural resources into assets that will help stimulate sustainable development (IMF, 2012a). Failure to create a strong economy out of natural resource wealth has been documented in a number of studies (e. g. Auty, 1993; Sachs and Warner, 2001; Ross, 2001; Sala-I-Martin and Subramanian, 2003 and Smith, 2004). Resource wealth has been associated with weak state institutions, high rates of poverty, conflict and corruption. In addition, oil has frequently been perceived as a barrier to democracy (Ross, 2001, 2011, 2014; Bategeka and Matovu, 2011; Sala et al., 2003). A survey of the economies of Libya, Nigeria and Azerbaijan exposures of the symptoms of the resource curse. By contrast, countries such as Australia, Norway, Canada and Botswana are realising positive outcomes from their resource wealth through sound economic policies (Auty, 1995; Collier and Hoeffler 2004).

The main argument addressed in this chapter is that Resource-Rich Developing Countries suffer with particular reference to Libya from what is known as the resources curse and the Dutch disease to with shed light on Libya because oil is the main revenue which shaped the Libyan economy structure and the political system in Libya. It can be regarded as the main factor that brought about weakness to the productivity sectors such as agriculture, fisheries, manufacturing; it made the country unable to compete either in domestic or foreign markets.

2.1 Resources Curse Theory

The 'resource curse' or the 'paradox of plenty' can be traced back to Richard Auty (1993, 2001) - an economic geographer. Auty In his book, *Sustaining Development: in Mineral Economies: The Resource Curse Thesis* (1993) scrutinized the effects of the Dutch disease on several countries that relied extensively on producing copper, tin and bauxite. In the first part of the book, he examined the responses of countries like Bolivia, Peru, Chile and Jamaica whose economies are dependent on minerals and in the second part, he investigated the economies of Papua New Guinea and Zambia regarding the mineral price bust that follows the increase in oil price in the 1970s and early 1980s focusing on the expansion of the mineral booms caused by government expenditure policies, while other sectors were made uncompetitive due to the presence of large rents in the economy. These are the most important economic problems encountering Latin American mineral economies. Actually, the exchange rate during the mineral booms attempts to weaken the non-mining tradable countries as a result of the Dutch disease. On the other hand, the required reimbursing expansion of the non-mining tradable sector during the mineral downturns seems to be uncertain. In his book, the government management failures are uncovered as the key determinants of the loss of the mineral economies were reviewed. Auty's study demonstrates that good economic management can reduce the adverse Dutch disease effects. Furthermore, Auty (1993) noted that there was no strong positive correlation between a country's natural resource wealth and its social, political and economic well-being. There was instead the opposite, namely, an inverse correlation. A wealth of natural resource was associated with economic stagnation, financial crises, and constant conflict between the people and government, which in turn had the capacity to explain why the government in such countries was often authoritarian and worked against the interests of the people; hence the term 'the paradox of plenty' Auty (1993). Familiarity with the countries discussed in this chapter will clarify points made in later discussion of the resource curse phenomenon.

2.1.1 Dutch-Disease

The term Dutch disease was devised in 1977 by the economist magazine (Smith, 2014) to describe a decline of the manufacturing sector in the Netherlands after the discovery of a large natural gas field in 1959. This became an issue that gave rise to a great deal of theory and experimental debate. Dutch disease affects the economy as a result of the huge influx of money. Dutch disease refers to "a situation where growth in national income from natural resource extraction damages other sectors of a country's economy" (Global Oil Facts and FAQ's, 2012). The economic mechanisms of Dutch disease damage the non-oil sectors in two respects: firstly, via deindustrialisation, and secondly via overvalued currency. These will be discussed following a general overview of the notion of 'Dutch disease' (Cordon (1984).

Dutch disease is an important element of the resource curse (Frankel, 2012), which emerged as a result of the impact of oil and gas in the North Sea, off the coast of the Netherlands in 1959. According to Corden (1984:359), "Dutch Disease refers to the adverse effects on Dutch manufacturing of the natural gas discoveries of the 1960s, essentially through the subsequent appreciation of the Dutch real exchange rate." It has since been used to refer to negative changes in economic structures as a result of large capital inflows to the economy, such as primary resources income and subsidies. After the discovery of oil and gas, the value of the Dutch currency increased and fears were roused because of de-industrialization and a significant decrease in industry's contribution to the gross domestic product in the 1960s.

As mentioned above, Dutch disease leads to deindustrialisation and overvalued currency. Utomi (2003) argues that revenues from oil impacted negatively on development and progress causing the emergence of Dutch disease. These revenues confused people including government officials, leading them to think in terms of distributing the wealth by sharing it out instead of using their own abilities to think about how such revenue could otherwise be taken advantage of. In addition, he points out that countries could benefit from the experience of Botswana, which was able to rein in spending, because this protects the structure of the economy from debt and deficit. As a result, Botswana started saving part of its revenues from diamond into a stabilisation fund that could reduce any unexpected shortage of revenue or any crisis. In the case of Nigeria, on the other hand, the Dutch disease inflate; rising prices led to uncontrolled higher spending through ill co-ordinated decisions (Ross, 1999). When oil prices collapse, projects stop being implemented, and the private sector is adversely influenced. Utomi (2003) also stressed that the crisis brought about under such conditions is not solely economic but moral as well because the revenues derived from this resource do not only belong to one generation but to future generations as well.

It is now possible to look more closely at the way in which the Dutch disease impacts negatively on the non-oil sectors—starting with deindustrialisation. This is what has occurred in the vast majority of oil-rich developing countries, where all economic, social and political attention has centred on oil to the detriment of the tradable sectors. In 1982, Corden and Neary developed what has become one of the best-known economic models about the Dutch Disease: the Spending Effect and Resource Movement Effect. This model describes how, according to economic theory, a booming sector will bring Dutch disease and impact on other parts of the economy. Corden and Neary divided sectors into three types: the booming sector (oil, minerals, and primary commodities such as coffee); the lagging sector (manufacturing and agriculture); and the non-traded goods sector (services and construction). The booming sector will impact on the economy in two ways, via the resource movement effect and the spending effect. In the resource movement effect the demand for labour will rise in the booming sector and thus employment will move from the lagging sector to the booming sector. In the case of oil, this will not happen because employment opportunities in oil sector are limited. In others words, the manufacturing sector shrinks whilst the non-traded goods sector grows. The second impact will be on spending: revenues that are obtained from the booming sector will increase the demand for labour in the non-tradable sector—therefore the prices of these commodities will rise. In addition, the tradable sector will gradually tend to decline while the non-tradable sector will tend to grow due to an increase in government spending as a result of huge revenues obtained from primary commodities (Cordon, 1984; Struthers, 1990; Sachs and Warner, 1995). Furthermore, the deterioration of the traded goods sector also leads to lack of accumulation of work experience in the productive sectors, both at the individual and at the state level. In others words, a shortage of skilled labour ensue, that is, labour with the ability to achieve productivity in various sectors and industries. This is the challenge faced by rich developing countries as they strive to develop.

The Libyan economy, for instance, is marked by a lack of a professional skilled workforce; a mixture of both inexperience and lack of skills (Porter and Yergin, 2006). This is especially so in the productive sectors and in particular, the fisheries sector (Porter and Yergin, 2006). Explanation for this may be found in the fact that the Libyan economy did not go through real experience in any tradable sector. Thus, the Libyan workforce has not had the opportunity of "learning by doing". Academic education alone is not enough to create a skilled workforce in the labour market: training and practical work are crucial. Porter and Yergin (2006) argue that one of the obstacles standing in the way of development in Libya is a shortage of high skills required in the labour market, even though the educational level of the Libyan workforce is good and literacy rates are high; this issue needs to be addressed quickly.

Resource-rich developing countries need to develop the skills of their workers through 'learning by doing' - a concept developed by Arrow (1962) in his theory of endogenous growth to clarify effects of technical and innovation change. Arrow's (1962) notion sees work as vital and essential for development, the backbone of internal growth which comes via the practice of productive activity. He also stressed that economists cannot deny the active role that technology plays in economic growth. However, he acknowledges that one shortcoming of his model is that an improvement in the quality of the workforce inevitably comes with the passage of time and that this leads to increased productivity. Learning does not just come through the normal production process but takes place as people take part in those social organisations which aim to accelerate and develop the learning process which affects productivity. Yang and Borland (1991) have shown that learning by doing plays a vital role in a country's development of greater specialisation in production. In addition, van Wijnbergen (1984) states that economic growth is explained mostly through learning by doing, which is usually practised in the manufacturing sector. This results in the development of human capacity and technology; by contrast, the Dutch disease leads to weak growth in the long run. Levitt et al. (2012) tested the impact of learning by working to improve the productivity and efficiency of work through a pilot study carried out in an assembly plant for cars. They believed the main driver for economic growth in the long-term was increase in the total factor of productivity. For example, most of what is learned by workers in a factory does not stop at the workers, but moves up to the administrative and managerial levels as workers report the problems they experience; and then, in turn, knowledge of these problems is passed on to the board of directors, whose members try to resolve the problems. Therefore, this one important mechanism allows for knowledge to be transferred from workers to the production process itself. The accumulation of workers' knowledge and experience is a key to productivity growth because workers' high skills are the main tool for innovation, that is, the element that lies at the core of competitive advantage theory (Porter, 1998) as advanced in this study (see chapter five).

A number of studies, by van Wijnbergen (1984), Krugman (1987), Sachs and Warner (1995) and Gylfason et al. (1999) found that when the exploitation of more natural resources shrinks the traded (or industrial) sector, learning by doing and thus productivity growth falls. Furthermore, Van der Ploeg, (2011) states that higher revenue from a booming sector stimulates the movement of labour away from tradable sectors towards non-tradable sectors; and this in turn reduces learning by doing which reduces labour-augmenting technical progress: thus a booming sector permanently reduces the rate of growth.

It is now time to turn to the second way in which the Dutch Disease impacts negatively on the non-oil sectors, namely, via - overvalued currency. An increase in the price of raw materials and a flow of revenue causes pressure on the currency and thus raises the exchange rate. This is one of the important indicators of Dutch disease. A currency's strength becomes a source of concern when it leads to the tradable sectors being unable to compete. However, prices of tradable goods do not change on the international market. Only the real exchange rate increases and this has a negative impact on the economy (Corden, 1984; Corden and Neary, 1982; Benjamin et al., 1989). This in turn leads to a weakening of economic growth in the country because home produced goods cannot be sold abroad, as their prices have become too high. Competition loss in the international market may lead to large losses for producers which might prevent them returning to compete again. Auty (1993) cited in Krugman (1987) stated that it is the rise in the real exchange rate which causes a loss in the ability to compete; some activities will find it difficult to regain competitiveness when the exchange rate once again depreciates. Any rise of the real exchange rate of the currency increases the demand on non-tradable goods trading at the expense of tradable goods, and the excessive exchange rate assessment leads to damaged growth. In addition, the impact of a high exchange rate is manifested in many indirect aspects. For example, in the Dutch case, appreciation of the real exchange rate was not caused by nominal appreciation of the currency, but by wage increases in manufacturing in excess of those in a competitive country (Struthers, 1990 cited in Corden, 1983). In short, mismanagement of oil and gas wealth revenue leads to contraction in the tradable sector, leading to inflation in the non-tradable sector. Also, the appreciation of the real exchange rate leads to a contraction of the traditional export sectors and inflation in the non-traded sectors (Benjamin et al., 1989)

2.1.2 The Rentier State

Having addressed the impact of the Dutch disease, it is now possible to move on to what has been identified as one of the main elements of the resource curse, that is, Rentier State. Beblawi (1987) state that rent is not merely an income for landlords, but generally a reward for ownership of all natural resources. 'Mines, as well as land', affirms Ricardo, "generally pay rent to their owners and this rent, as well as the rent of the land, is the effect and never the cause of the high value of their produce'' (Ricardo, 1962: 590). It has been argued that the rentier state is an indicator of the resource curse (Shaw, 2013; Karl 2005). Luciani (1990) considered rentier as a social function rather than an economic category; it could be conceived as a member of a certain group that has its share in the economic production despite the fact that it does actively partake in the economic production process; it is at times an attractive share. In fact, the distinctive feature of the rentier lies in the absence of a prolific perspective of its behaviour. In the 1970s, the advent of the new oil states and their elevation to leading finance and global trade revived the notion of rentier economies. An extra wealth of unparalleled amount in such short time invigorated the concept of income that is not earned, the rentier economies. The effect of oil on the state role and on economic behaviour generally has been so intense in the Arab world during the 1970s as to demand unusual treatment. The notion of a rentier state is selected because there is no better notion that describes the eminence of the oil economies in the Arab region (Luciani, 1990). As Levins (2011) puts it, rent, in the typical economic theory, was defined as the excess that was left over after meeting all production costs; it was paid to the land owners in return for using the natural resources. Basically, rent is the recompense for resource ownership and it occurs in all economies in variable degrees. The notion of rentierism could be defined as the rent percentage in the revenues of a government. Whereas the notion of a rentier state is not limited to the Middle East countries, it is primarily related to the Arab states that export oil and that have greater shares of economic rents caused by their thriving industries based on petroleum. In addition, the country's economy is dominated by rents rather than productivity. The small size of the population—little over nine million—compared to the amount of oil has also helped these countries to become a rentier state (Herb, 2005). Several studies have provided numerous theoretical frameworks that could be applied to the Libyan case; among these studies are (Mahdavy, 1970; Vandawella, 1998; Karl, 2005; Di John. 2006; Mehlum et al, 2011; Levins, 2011). They specified the central features of a rentier state which can be summarized as follows:

corrupted and inefficient government, weak institutions, and slow economic development besides more volatile oil markets. According to Di John (2011), the abundance of oil and minerals in the rentier state model is presumed to engender an intervention characterized by growth-restriction and unusually large amounts of seeking rents; such rent-seeking competitions are expected to be evenly negative with respect to the developmental consequences they create; besides, the increases in seeking rents and corruption rates reduce investment in the long-term developmental projects resulting in lower growth rates; oil rents offer an adequate financial base for the state; thus, reducing the need for the state to impose taxes on its citizens; that makes a government more capricious, authoritarian, and even voracious. Additionally, Levins, (2011) observed that the lack of skilled labour results from depending heavily on external rent. The state usually relaxes its control on foreign exchange due to the availability of large amounts of external rent; thus, the cost of foreign exchange drops. Consequently, imported goods gradually substitute domestic ones because of the price of imported goods which is too low to benefit local workers. This characterizes most remarkably the agriculture and manufacturing sectors, because the Arab states are unable to contest with other far-reaching economies that rely on innovative production techniques. Such discrepancy leads to reduction in indigenous production and to fewer opportunities for the less advantageous groups that are not encompassed within the oil economy.

Many specialists describe the countries of the Middle East and North Africa as rentier states because most of their revenue comes from abroad (e.g. Ross, 2001; Elbadawi and Makdisi, 2011; Schwarz, 2008). Libya, Kuwait and Saudi Arabia, for example, derive more than three-quarters of their income from oil (Ross, 2001). This leads 'rentier elites' not to seek to add value to these revenues through investment in the productive sectors or industries. These countries are vulnerable to financial crises because oil prices are highly sensitive to external and internal shocks. It is this 'rentier behaviour' that turned Libya into a typical example of a rentier state (Vandawella, 1998). The rentier economy of the Qaddafi regime marked the core of the socio-economic calamities that were behind Libya's revolution (Meijia and Castel, 2012). (Evidences about Libya are highlighted in the subsections of Resources Curse and its Impact: Oil Price Volatility; Political Dimension and Economic Dimension).

2.2 Resources Curse and its impact

Now that the overall notion of the resource curse has been discussed, this chapter will move on to what many consider Resources Curse and its impact.

This section discusses the political, social and economic dimensions of the large inflows of oil revenues. The social and political dimension is corruption and dictatorship and the deterioration of democracy; the economic dimension is the effect of Dutch disease on the economy.

2.2.1 Oil Price Volatility

Crude oil is an international product that is traded at the international oil market. Prices of crude at this market tend to move closely together, but can be affected by incidents that have the potential to disrupt supply (such as geopolitical and weather-related developments), than by disparity in grade or quality. The price of oil is hypersensitive to any event, whether internal or external, that may lead to disruption or uncertainty for future oil supply because the world economy is still largely driven by oil and so also, the economies of supplier nations are typically driven by crude oil market (Rentschler. 2013; Santos, 2010). For example, the Libyan Civil War together with the continued geopolitical pressures on the Iranian nuclear program has placed momentous pressure on oil prices in 2011 (Triki and Affes, 2011). According to (Rentschler. 2013), any change in oil price significantly affects global economy, national economic growth and development, and well-being of countries all over the world. Governments that primarily depend on few resources encounter numerous economic challenges. On the top of the list is the excessive instability of commodity prices (Meijia and Castel 2012). Furthermore, oil volatility impacts macroeconomic activity in different ways: sharp increase or decrease in oil prices, may decrease aggregate output provisionally since by raising uncertainty, they defer business investment or prompt expensive sectorial resource restructuring (Guo and Kliesen, 2005). Oil price changes directly affect unemployment rate (Phelps 1994; Caruth et al., 1998) and business progression (Davis 1986) in these countries.

Not only does oil price instability leads to poor economic activity in oil-rich countries Karl, (2005), Rentschler (2013), for instance, presented evidence to document that a rise in oil price instability has negative economic consequences on numerous kinds of economies. The study made use of samples from both service-and industry-based economies of USA, Japan, Germany, India, South Korea and Malaysia. The study demonstrated that from 1986 to 2011, oil price instability inflicted serious damage on the GDP of all the sample countries. Oil price instability increases price volatility in all countries irrespective of their trade balance; they decrease planning horizons and drive companies to delay investments. Any sudden change in oil prices during a thriving period creates management problems to policymakers. The greatly instable nature of the oil markets negatively affects oil-exporting countries which are often the victims of the unexpected fall in their per capita income. According to Yahia (2008), the Libyan economy primarily depends on oil exports. Overtime, several researchers examined the impact of oil price fluctuations on economic growth, economic activities and the performance of the Libyan economy (see, for example, Heitman, 1969; Baryun, 1980; Abohobiel, 1983; Youins, 1993). Libya's economy like that of any other developing economies has been affected by global oil price changes.

For instance, the first oil price shock was for the period, 1973 – 1977. In 1973, the war between Egypt and Israel led to an increase in oil prices: the barrel of oil jumped from US$2.48 to US$11.58 (Suleiman, 2013). This had a great impact on the Libyan GDP. As indicated by Yahia and Metwally (2007), striking upsurge in Libyan GDP happened in 1973, after the oil embargo, resulting in a rise in export prices. The rise in GDP is thus, attributed to the activities of the export sector, particularly to the increase in oil prices. The total real GDP increased from 4858.5 21 million Libyan dinar in 1970 to 14481.59 million Libyan dinars in 1977, and it continued until 1980 where it reached 16465.13 million Libyan dinars, and then began to decrease due to shocks in oil prices (Suleiman, 2013). Nigeria is another example of a country subject to dramatic fluctuations in the price of oil. In the boom period of the 1970s, its economy suffered from inflation. Nigeria's economy is vulnerable to shocks, and the image of Nigeria's economy is one of instability (Watts, 2004; 2008).

The Iran-Iraq war that took place between 1978 and 1982 led to high oil prices resulting in a loss of nearly 2.5 million barrels of crude per day OPEC (2005). The Iranian revolution coincided with this event and raised oil prices from US$14 to US$35 a barrel in 1981 (Williams, 2011). This also impacted on the Libyan economy because it curbed the activity of the private sector and led to domestic price inflation (Mazar, 2012). In 1986, oil prices again collapsed to nearer US$8 a barrel due to increased exploration and production outside OPEC, leading to cut back of OPEC's production (WTRG

2010). However, additional agreements with other non-OPEC countries eventually led to decrease in world-wide production, thus stabilising prices at US$18 per barrel between 1981 and 1987. In year 1994, the price of oil again dropped fallen to US$14.74 due to significant decrease in demand from Asia and the Pacific, (Suleiman, 2013). In Libya, there was a huge impact on economic policy; for instance, development plans were abandoned as a result of shortage in oil revenues and deficit in spending (see chapter three for further details). The paucity of funds meant that alternative sources have to be secured. Hence, the Libyan government made a policy summersault of bringing the private sector into the affairs of so-called socialist state (Mazar, 2012).

From 2003 to 2009, there was a surge in oil prices due to the Gulf War, the strike in Venézuela, improvement in United States economy and increasing demand on oil by China. The prices rocketed from less than US$20 to US$40-50 per barrel. (WTRG, 2010) The price of oil rose to its highest level in history in 2008. The price of a barrel reached a peak of US$147 before dropping to US$70 a barrel in 2009 (Suleiman 2013). During this boom periods, the rate of inflation in Libya rose in the second quarter of 2005 due to too much money in circulation and the consumer prices increased due to rapid increase in inflation (it jumped from 2.4% in 2005 to 6% in 2007) (Mazar, 2012). As a result of surplus revenues from oil, there was massive increase in the volume of investments from the annual average of 3.3 billion (2003-2004) to 23.9 billion from 2007 to 2008. During the period from 2009- 2010, inflation rate decreased to 2.4% per annum, but the uprising in February 2011 drove inflation up to 16% (this figure only reflects the rate of inflation in the city of Tripoli because data is not available from the rest of Libya). The current prolongation of the conflict led to the scarcity of goods, especially fuel and to the emergence of a parallel market in currency and commodity where, for instance, the price of a refined gasoline per litre is sold for 9.5 Libyan Dinner in 2015 from a price of only 0.15 Libyan Dinner in 2012(Mazar, 2012). Just like Libya, the countries that depend on oil need to develop policies that have the potential to strengthen the economy and to diversify it. This means that the dominating role of oil in the economy needs to be reduced, and financial matters need to be controlled, which can be achieved by the control of receipts from the liquefaction of crude oil (Akpan, 2009; Ogunleye, 2008; Struthers, 1990).

It would be recalled that this research relates not only to developing competitive sectors that diversifies Libya economy, but also ensures food security and self-sufficiency –

that is why the researcher relates the problem of food security and oil prices. The increase in crude oil prices directly impacts agricultural product prices in that they increase input and transportation expenditures (Gardebroek and Hernandez, 2012). Price volatility may increase as a result of the increasing strength of the links between agricultural markets and energy markets and an increase in the frequency of shocks caused by changing weather and agricultural output varies from period to period because of natural shocks such as weather and pests (FAO et al, 2011) . The Food and Agriculture Organization (FAO) that belongs to the United Nations noted that meat consumption worldwide has gone up from about 100 to 235 tonnes for the period from 1970 to 2000 and continued to rise (Steinhart, 2014). Accordingly, the state of food insecurity in the world is likely to continue rising, and volatile food prices will increase demand of consumers in the fast-growing economies, in the light of the continued increase population, and expansions in the production of biofuels will impose additional pressure on the food system. Figure 2.1 highlights the relationship between food prices and oil prices whereby food prices are affected by the fluctuations in oil prices.

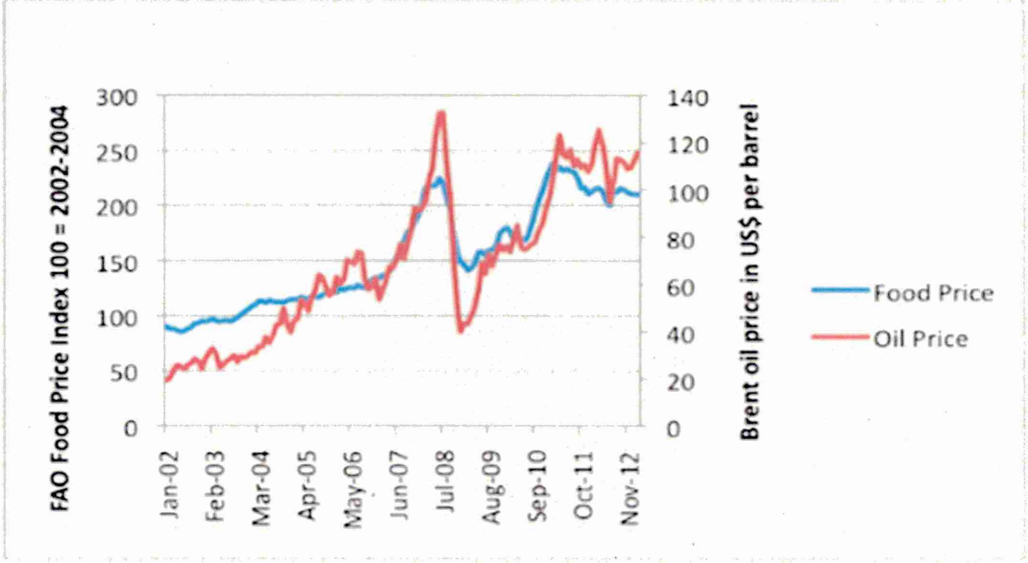

Figure 2.1 Food and Oil Prices are correlated

Source: (Tverberg, 2013) How Oil Exporters Reach Financial Collapse. Our Finite world

Libya imports 75%-80% of its food which constitute 16% of the total import expenditures from 2005 to 2007 (FAO, 2011). The Libyan ratio of food exports to imports is quite low. The ratio assesses the capability of a country to fund its food imports out of the entire export incomes. Statistics available from 2008 revealed that maize and wheat are the central imported cereals. For the period from 2005 to 2007, 84% of the used up wheat flour was imported. If it is compared to the 74% for the period 1990- 1992, it reflects the increasing reliance on import of wheat due to population increase. Meat and dairy products constitute a substantial share of the import bill. Consumer prices went up in 2010, replicating the rise of the prices of grain on the international export markets, mainly due to increase in oil prices. Such growth was sharp between June 2010 and early 2011; it is marked with an increase in the cost of imported maize, wheat, rice, among other grains. Wheat is a major commodity in Libya and most of it is imported from abroad, the dairy products and meat contribute significantly to the bill of import (FAO, 2011). Libya's current predicament has highlighted the significance of realising food security.

Due to export embargoes and other trade restrictions, coupled with the recent crisis, Libya is also suffering from shortage of imported food, whereas fish resources that are in abundance are yet to be fully developed. Therefore, fishery sector is an important source that can be relied upon to enrich the local diet and to increase foreign exchange earnings. Besides, international oil price may not adversely affect fish consumption as it is to imported grains. The goal of this study was to analyse in detail the comparative advantage of Libyan fisheries sector that can be converted into a competitive advantage, so as to contribute to the diversification of the Libyan economy. Oil price drop highlights the need for diversity in the Libyan economy particularly in the non-oil tradable sectors; the greater the diversification, the less the exposure to instability would be (IMF, 2014). According to international monetary Fund (IMF) (2014):

> Success or failure appears to depend on the implementation of appropriate policies ahead of the fall in oil revenues. Malaysia, Indonesia, and Mexico offer perhaps the best examples of countries that have been able to diversify away from oil, while Chile has had some success in diversification away from copper.

The impact of oil price volatility on food prices is huge; it makes a country unable to provide the food bill in the event of falling oil prices, and this phenomena is since felt in Libya; thus diversify the Libyan economy is needed.

2.2.2 Political Dimension

As a result of the vital role institutions play to the polity and economy of a country, there is growing consensus that institutional weakness is critical to the resource wealth discourse (Collier and Hoffler, 2009). Generally, institutional quality framework and the dependence on resource wealth interact mutually to determine country's growth potential following resource boom-bust cyclical periods. For example, there are instances where resource rent has enhanced democracy and strengthens institution (Dunning, 2008). For example, Norway's oil income from the North Sea in the late 1960s and 1970s has promoted its democracy; additionally, Botswana's rich diamonds is often described as a democratic success story. Norway is at the head of the countries that respect freedom and human rights (see table 2.1). Botswana, one of Africa's most stable countries, is the continent's longest continuous multi-party democracy. It is relatively free of corruption and has a good human rights record (Botswana profile, 2014). On the one hand, resources rents can damage political system or weaken institution's ability to convert revenues into sustainable development (Vandewalle, 1998; Karl, 2005; Collier and Hoeffler, 2005; Egorov et al., 2007; Al-Sabah, 2011; Di John, 2011; Li, 2013; Ross, 2013, 2014). Rents on natural resources such as oil strengthen the grip of dictatorial rule (Mahdavy 1971; Beblawi, 1987; Ross 2001) and dominance of leaders' ideologies (e.g. Lawless and Findlay, 1984; Vandewalle, 1998, 2006; Abuarosha, 2013), leading to unrest and turmoil (Alesina et al., 1996; Hussain, 2014). Angola is considered by Hodges (2004) as a realistic example of a developing country that is rich in natural resources particularly oil and minerals but at the same time most susceptible to armed conflict, inadequate governance and poor performance with respect to economic and social development. Table 2.1, for example, compares indicators used in assessing institutions. Table 2.1 shows some indicators used to assess functioning of institutions and Political system.

Table 2.1: Some indicators used to assess functioning of institutions and Political system by Kunčič, (2015)

	Libya	Angola	Nigeria	Norway	Botswana
Legal institutions					
Property rights[2]	10	15	30	30	70
Civil Liberties[3]	6	6	5	1	2
Judicial independence[4]	95	137	102	4	35
Economic institutions					
Business freedom [5]	46.8	47.4	48.3	92.1	66.8
labour freedom	66.7	43.2	77.7	48.2	70

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[2] Higher scores are more desirable, i.e. property rights are better protected. Scores are from 0 to 100 (Global Property Guide)

[3] Less scores are more desirable from 1–7.

[4] Judicial independence - Rank (1=the best)

[5] Higher scores are more desirable.

	Libya	Angola	Nigeria	Norway	Botswana
Monetary Freedom	--	65.4	70.4	81.7	73.9
Open Markets[6]					
Trade Freedom	80	70.2	63.8	89.4	72.2
investment freedom	5.0	40	40	75	70
Financial Freedom	--	40	40	60	70
Economic Environment[7]					
Ease of doing Business	188	181	170	6	74
Starting a Business	144	174	129	22	149
Registering Property	189	164	185	5	51
Protecting Minority Investors	188	94	62	12	67
Paying Taxes	157	144	179	15	49

Source: World Bank Group (2015) Doing Business, measuring business regulations http://www.doingbusiness.org/rankings ; Knoema (2014) the Global Competitiveness Report 2012-2013; 2015 index of Economic Freedom; the Heritage Foundation and WSJ. The international Property Rights Index 2014, Country Comparison, the Global Competitiveness Index 2014-2015 data platform, 2014.http://www.globalpropertyguide.com/Europe/Norway/property-rights-index Global Property Guide (2014) http://www.globalpropertyguide.com/Africa/Botswana

Several studies have provided numerous theoretical frameworks that could be applied to the Libyan case (such as, Vandawella, 1998; Mahdavy, 1970; Karl, 2005; Levins, 2011). Together, these authors have described Libya's political and governance system as: inefficient, feeble, slow and characterised by the rentier economy of the past regime. As already indicated in section 1.1, oil is permitting Libya to accumulate wealth, however, for the past 40 years of oil exploitation, it typified an undiversified economy that is dominated by state monopoly, afflicted by persistent rent-seeking and institutional deficiencies. The most obvious impact of oil is on Libyan institutions. As can be seen further, Libyan state structure covertly operates clientalism (where politicians or rulers use the principle of *take there*, *give here* of state resources); had centralised the economic power of the country in the hands of few individuals and loyalists; and operated in an environment where individual interests outweighed the majority of the populace. As a result, government accountability suffered and it allowed loyalists, associates and elites close to the regime to warren and hollow out public institutions by granting those in position of authority the power to operate arbitrarily without oversight (Mazar, 2012).

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[6] Higher scores are more desirable.
[7] Less scores are more desirable from 1–189.

Looking at similar problems in the Middle Eastern and North Africa (MENA) and elsewhere, Thomas Friedman (2006); *New York Times* columnist, identified a 'First Law of Petropolitics' (Figure2.2) based on a 30 year examination of how crude oil prices relates to freedom and political powers in some OPEC countries. Friedman argued that: "the higher the average global crude price of oil, the more free speech, free press, fair elections, an independent judiciary, the rule of law, and independent political parties are eroded" (Friedman, 2006:29). But as countries run out of oil, they are increasingly becoming democratised and open to free trade. For example, because Bahrain is allegedly one of the first countries in the Gulf to run out of oil, it is gradually being democratised, allow certain level of press freedom and the first to undertake a total overhaul of its labour laws (Friedman, 2009).

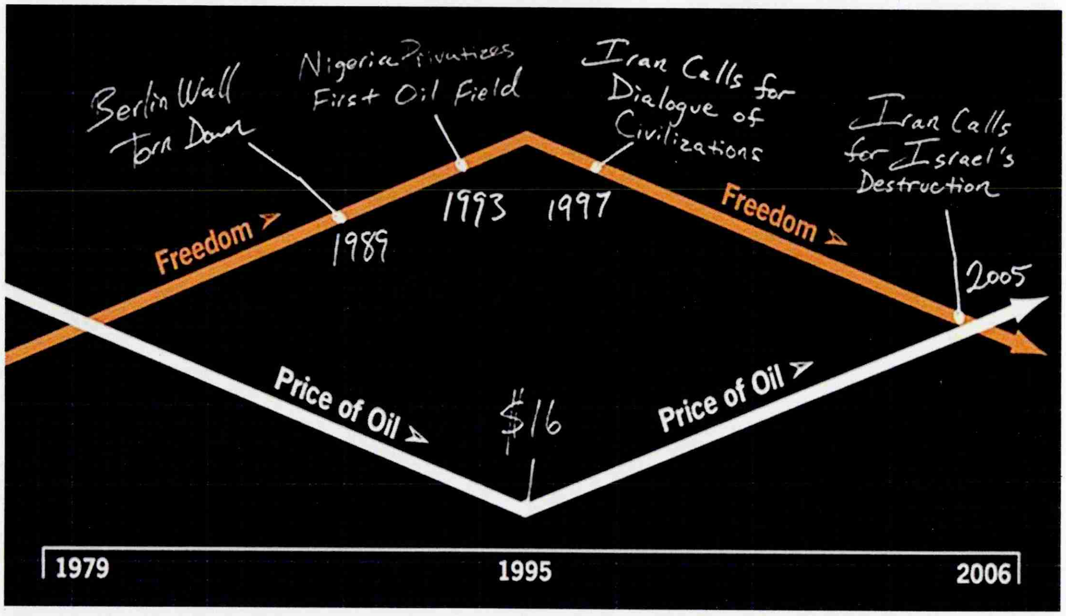
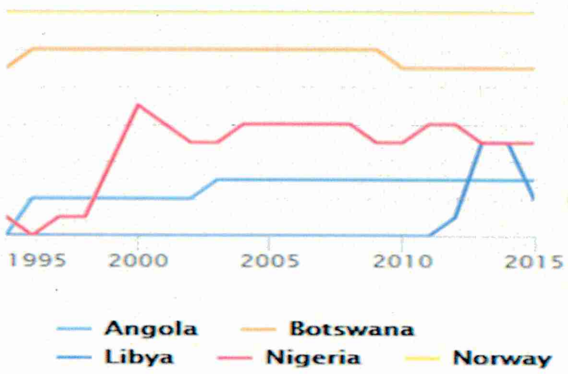


Figure 2.2 As the price of oil increases, economic values and freedom are deteriorating.

Source: Friedman (2006) the First Law of Petropolitics

However, Herb (2005) does not strongly believe that the rentier hinder the development of democracy; rather he considers other factors such as the geographic location, individual income, and the religious constitution of a country's population as anticipators of regime type. This is not due to the availability of wealth, but to the political conditions in these countries that could be exploited (Hammond, 2011). To buttress the above argument, Figure 2.3 compares the evolution of the freedom levels of some rich-resource countries, according to the 2015 ranks of freedom in the World. Each country's score is based on two numerical ratings, from 1 to 7 for political rights and civil liberties, with 1 representing the most free and 7 the least free. These indicators, of course, depend on the type of governance. From the figure 2.3, it became evident that the level of the basic political rights and civil liberties of the citizens in Libya are low compared with those of other countries that are rich in natural resources but have dealt with the wealth differently. For example, Angola, Botswana, Libya and Nigeria are OPEC countries, Norway is non-OPEC and Botswana is non-oil rich country, but they differ in translating resource wealth into development. For example, Botswana was classified in 2014 as a democratic state that respects freedom and human rights.



	2011	2014
Angola	5.5	5.5
Botswana	2.5	2.5
Libya	7	4.5
Norway	1	1
Nigeria	4	4.5

Figure 2.3 Evolution of freedom for some rich resource countries

Source: Freedom House 2015, Freedom in the World

Similarly, Fergany et al (2002) defines good governance as the rule that upholds, enhances and protects human well-being; it is based on upgrading human potentials and capabilities and providing opportunities for economic, social and political development and freedom. It seeks to represent all classes of people, who are all responsible for carrying out their tasks in the interests of all the people. According to Kato et al. (2000), governance is the exercise of power regarding economic and social state resource management with the aim of achieving development. Countries with good governance exercise authority under the law through state institutions and organisations that are subject for accountability with full transparency and people are allowed to participate in development and policy decision making processes. Kaufmann et al. (2008:7) define governance, broadly, as “the traditions and institutions by which authority in a country is exercised. This includes the process by which governments are selected, monitored and replaced; the capacity of the government to effectively formulate and implement sound policies; and the respect of citizens and the state for the institutions that govern economic and social interactions among them’’. In addition, De Rosa and Lootty (2012) highlighted World Bank's Worldwide Governance Indicators (WGI) that underscores diverse aspects of governance (voice and accountability[8], absence of violence and political stability[9] and government effectiveness[10], rule of law[11], regulatory quality[12] and corruption control[13]). According to Kaufmann et al (2008), these parameters can measure the progress a country makes; its economic growth, the institutions efficiency and the level, presence or absence of corruption in a country.

Table 2.2 exhibits governance and political indicators which reflect the extent of efficiency of political system that governs some rich resource countries: Libya, Angola, Botswana, Norway and Nigeria are taken as examples. The data from the table demonstrate that Norway and Botswana were able to evade the resource curse. According to Mazar (2012), these countries have stable political institutions and systems with solid rules of accountability and civil society control that were effective before the discovery of oil. When oil was discovered, trend rents appeared at first limited, but as a result of entrenched political and social systems, they were not directed to the community or to the behaviour of the institutions.

Table 2.2 Governance and political indicators 2014

Indicators*	Angola	Botswana	Norway	Nigeria	Libya
Voice and accountability	-1.12	0.47	1.76	-0.74	-1.56
Political Stability and Absence of Violence	-0.37	1.06	1.33	-2.08	-1.29
Government Effectiveness	-1.26	0.28	1.86	-1.01	-1.35
Regulatory Quality	-1.05	0.66	1.65	-0.71	-1.54
Rule of Law	-1.28	0.59	1.97	-1.16	-1.18
Control of Corruption	-1.32	0.92	2.29	-1.2	-1.29

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[8] Capturing perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media.

[9] Capturing perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including politically-motivated violence and terrorism.

[10] capturing perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies.

[11] capturing perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence.

[12] Capturing perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development.

[13] Capturing perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests.

Source: TheGlobalEconomy.com; Governance and political (2014) ranking indicators in Libya, Angola, Botswana, Norway and Nigeria. *(-2.5 to +2.5).

According to Hitt et al. (2003), governance has become an issue in our time because it is a comprehensive system that is capable of easing conflict and enhancing integration and interaction between various parties; thus it contributes to the effectiveness of disclosure and accountability as well as control and stimulation. Likewise, governance has become an important issue because it maximises the value of state and supporting its competitiveness, including help in creating new jobs and obtaining the required funding; it also assists in optimising the use of resources and promoting accountability and fair distribution of services and management, including the creation of a favourable business climate and enhancing accountability (Alter, 2003). Furthermore, it attracts investment, improves the efficiency of companies and maximises its benefits (Al- Abid, 2004). The following section addresses Libyan political system and the quality of its institutions, which are important elements in rebuilding Libya.

2.2.2.1 The political system in Libya

The political system in Libya began September 1, 1969, when Moammar Gaddafi led 'Al Fateh' Revolution and took power. Although the objectives of the Revolutionary Command Council (RCC) from the very beginning were freedom, socialism and unity (Mazar, 2012), Vandewalle (2008) argued that Gaddafi remained silent on their precise political structures and in the end the revolution did not bring about any ideological reformulations as relates to the objectives of the Libyan state. A new system of government was introduced in April 1973 via a popular revolution embarked on terminating the oil government bureaucracy and granting the people the right to employ and dismiss public officials (Otman and Karlberg, 2007). Having established its position, the revolution, from 1973 on, adopted numerous measures for reconstructing the Libyan economy and society. The new regime substituted the old system of royal support by a new one; it redistricted Libya's domestic and municipal governments to downgrade those who were in power during the monarchy. It also nationalised Libya's oil industry and banks to finance popular/people's congresses and committees that were formed (Vandewalle, 2006). The People's Committees were formed in June 1973 upon instructions from Gaddafi who had published the first Part of his Green Book.

In the Green Book, Gadhafi postulated what he termed the "Third Universal Theory"[14]; it is a concept highlighting his visualisation of the new government (Otman and

Karlberg, 2007). He advanced this theory as an alternative to both capitalist and communist ideologies. In the Green Book, Gadhafi defines the new structure and organisation of the Libyan Jamahiriya and sets out his philosophy on politics (the system of government in the state), economics and sociology. The Book consists of three parts. Part one deals with the political aspects, with the problems of politics and power in the society. Part two addresses economic situation, historical economic problems and solutions to the conflict between employers and the employees. Part three touches upon social issues: the problems of the family, mother, child, women, culture and arts (Mazar, 2012). The Book chapters had been published successively since September 1975 where each chapter exposes his views on one aspect of administration or economy. Vandewalle (2008) highlighted the ideological concepts that dominated the policy arena. The Arab nationalism and the Arab socialist system articulated in the Green Book was an alternative to capitalism and communism. It is worth noting that the ideology of the Libyan state is officially the personal creation of its leader, Gaddafi's personality, and the philosophy has profound implications on the way in which policy is formulated in Libya. Libya defines itself as *a Jamahiriya* – a state of the masses in which the authority of the people is the only source of sovereignty and decision making is exercised through 'direct democracy' in a stateless state. Thus, policy formulation and articulation are formally the prerogative of the authority of the people realised as unified. In fact, neither the parallel nor the practice is appropriate, as the inspiration for Gaddafi's ideology is rooted in his own personal, religious, and social experience. This was, perhaps, most acutely demonstrated in the 1970s.

Gadhafi's vision of the new government system aims at overseeing all ministries and institutions operations and functions. For instance, on how Libya can be ruled: on page five, he raises a number of questions and attempts to answer them in the same page, such as the route that has to be taken by human groups to get rid of the exploitation age. He asserts that the Green Book provides the ultimate solutions to the problems of managing governance and enlightens the path; the people have to take, to get rid of dictatorship and to realise real democracy (Mazar, 2012). To sum up, Colonel Gaddafi's Green Book presented his ideologies and philosophy on how Libya should be ruled, how the organisational framework of the Jamahiriya should be administered and how democracy should be exercised (Otman and Karlberg, 2007). Many researchers (e.g. Lawless and Findlay, 1984, Vandewalle, 2006; Abuarosha, 2013) have emphasised the fact that the Green Book contains Gaddafi's ideology which is supposed to be transferred into political and economic directives and orders to promote his power grip. For example, Abuarosha's (2013) recent study exposed three key drivers to the government's agricultural development policies have a direct impact on agricultural policies; these include 1) the political ideologies of Qaddafi as illustrated in the Green Book, 2) the availability of oil revenues, and 3) the adoption of planned economy criteria. In addition, Paoletti, (2011) highlighted that Libyans' had accepted these power edifices with no choice, until the civil war broke out in 2011.

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[14] In April 1973 Gaddafi announced Third Universal Theory, which was explained by a three volume book known as the Green Book. Gaddafi considered that Third Universal Theory to confront the theories of capitalism and communism. Third Universal Theory from his point of view is a cultural revolution to destroy the imported theories of capitalism and communism, whether of Eastern or Western origin. It ended in 2011.

In March 1977, the General People's Congress which was an establishment of the Third Universal Theory took the necessary measures to eliminate the Revolutionary Command Council, which had been the highest political authority in the country since the constitutional declaration of 11 December 1969 was announced. Political power was transferred to the so-called, People's congresses, their Committees, together with the General People's Congress. Furthermore, the conventional government, as well as the institutions, cabinet offices, ministers and directors were replaced by General Secretaries - each responsible for a specific state activity. For instance, foreign affairs, agriculture, and labour are overseen by the People's Committees at the domestic level. The secretaries from the various Libyan ministries formed legislative forum that interacted with the General People's Committee. Altogether, these committees are principally structured as a top-down model; they do not offer a place for political representation or for encouraging political participation (Ronen, 2005). The General People's Committee (GPC), for example only served as an intermediary between the majority masses and government leadership. Finally, Gaddafi was the appointed Secretary General of the People's General Congress (El-Shahat, 1978). Moreover, Libyan political leadership created unofficial force known as the popular social leadership, where traditional elites could assume a role for managing affairs and for interacting with people via institutions within the political system framework (al-Quadat al-Shabiya al-Ijtimaiya,). In September 1993, the Popular Social leadership was declared. When it assumed power, Qaddafi followed a strategy that reinforced political power while he proceeded in structuring Libyan politics (Vandewalle, 2006). Qaddafi's rule of Libya exceeded that of controlling a state to embed the civil societies: family members and close followers are set at the top of the Libyan charitable societies and business organisations. Independent entities were formed, and authority positions were distributed by Gaddafi among his relatives and family members (Zukowski, 2014). As it was mentioned by North (1990:16), "Institutions are not . . . usually created to be socially efficient; rather . . . , (they) are created to serve the interest of those with the bargaining power to devise new rules". This kind of institutional structure made by Gaddhafi is a typical example of the above quote Table 2.3 showing centres of influence in political decision-making in the era of Gaddafi.

Table 2.3 Centres of influence in political decision-making in the era of Gaddafi

The Colonel	Muammar Gaddafi	Supreme Leader and the sole Authority
The inner circle	The tribal men	People Gaddafi discusses with on various public affairs: relatives, tribal members, especially those in the security services
	Sons	Saif al-Islam: the potential heir to the rule Al-Mutassim: Security Affairs Advisor Khamis battalion commander Muhammad: General Information Body Al-Saadi: tourism and Sports Aisha: charity Association (Be together)
	What remains of the Revolutionary Command Council	Abu Bakr Younis: Defines Minister Khuwaylidi Hamidi Mustafa Kharroubi
People Organizations	Social People's Leadership	Tribal organisation
	Revolutionary Committees	Historic prominent members of the Revolutionary Committees
	Youth organization	Prominent members of the Youth organization
Others	Prominent members or veterans in the state and foreign dignitaries	

Source: Mazar (2012). Libya Hopes and Missed Opportunities.

The practical application of Gaddafi`s theory to make economic policy decisions was performed as follows. According to Mazar (2012), the proclamation of the People's Authority is followed by re-structuring the political and administrative system through the formation of small groups called Alkewmanat. Each of these includes a number of adult individuals, and for each community, there is a board that makes decisions by voting. The so-called (Basic Conference) serves as a local parliament; then there is an executive body for the Alkiomunat, called a Local People's Committee which is held accountable in front of the main conference. Numbers of Alcolmaanat (the Basic conferences) were 398 in 2010. It is annexed to 22 governorates. In the Libya provinces, it is called al-Shabiyat and its executive body occupies a central position. At the highest level of representation in Libya, there is a General People's Congress (Parliament) which includes all the provinces, and its members make General People's Congress visits more often annually (Mazar 2012).

The authority in Libya is exercised via the compulsory participation of Libyans in a number of congresses, each guided by a popular committee to deal with administrative matters, whereby all policy matters whether local, national or international are discussed with the heads of each congress being authorised to represent the congress at the regional and national levels (Vandewalle, 2008). According to Mazar (2012), GPC formulates decisions taken by the People's Congresses in the form of instructions. The appointment of the so-called Prime Minister (Secretary of the General People's Committee) is renewed annually since 1977. The most important Supreme decisions of the state were taken via discussions that took place in the core conferences; decisions and laws were issued by the General People's Congress (the Parliament) which is authorised to appoint ministers in addition to controlling the work of the ministries. "Muammar Gaddafi, as the recognised and undisputed leader of Libya had, absolute, ultimate and unquestioned control over the Libyan state apparatus of power, including the security force", International Criminal Court (ICC, 2011:5).

The members of the Revolutionary Committees overlook the basic conferences and participate in the discussions; they exercise control over the drafting committees. The revolutionary committees backed by the organisations are controlled directly by the commander's office (Mazar 2012).

Regardless of the number of people involved in the above congresses, independent entities were formed, and authority positions were distributed by Gaddafi among his relatives and family members – whose outcomes and opinions in most cases override those of the constituted congresses. Thus, the formal features of the governmental hierarchy which is linked to more conventional state structures were absent (*ibid*).

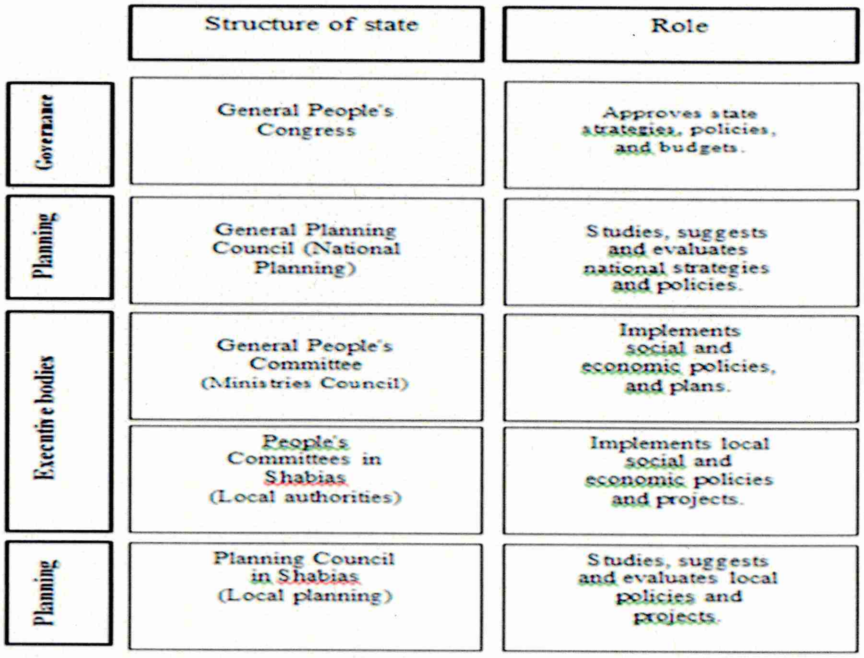
Besides, favouritism was evident: congress members must be loyalists and numerous Libyan economy companies are run or possessed by Qaddafi's inner circle members (many are members of Qaddafi's intimate and extended family). These companies and private entities enjoy favoured treatment, naturally obtaining greatly sponsored financial aid from the Libyan government besides political backing and regulatory support (Zukowski, 2014). At the same time, the Libyan political system calls for equality among all populaces, the government provides education to all citizens, free social care and free housing facilities. In return, it requires political allegiance (Otman and Karlberg, 2007). In other words, Gaddafi's government sought to prevent the accumulation of wealth in the citizens' hands for fear of creating a group that may have an impact on future political decisions. As such, economic policies in Libya followed the new Jamahiriya system aimed at obstructing the accumulation of private wealth (Altunisik, 1996). This does not mean, however, that the ideology of rulers, such as Gaddafi, is not subject to change. On the contrary, experience suggests authoritarian governments will not be delayed in changing their opinions or beliefs when they encounter a threat to their power or when the wealth of the state is threatened (Altunisik, 1996). In such situations, rulers call for economic reforms since the current economic restrictions will have made it politically impossible to continue implementing their earlier policies. For example, Gadhafi's propaganda regime adopted an economic reform program aimed at opening and privatising the economy (Allan, 1981). This was astonishing if one takes into account the Libyan regime's earlier policies along with its ideological rhetoric that strongly opposed private enterprise.

The result of these policies was the emergence of a generation who mostly are estranged to Libya's political system and of a government which did not succeed in exercising institutionalised control over the state's economy (Vandewalle, 2006). Incompetent framework of the Libyan state under Qaddafi and the regime's ferocious clampdown on political parties and of those who could possibly contest Qaddafi's control of power is known to suppress people's political participation (PCHR, 2012). In addition, following the implications and directions of the Green Book, Gaddafi prevented the formation of political parties, through the use of force and violence; in fact, he considered affiliation to parties as an act of betrayal. In otherwise, the leader was dictatorial and against human liberty that led to the disappearance of neither political and social association nor opposition (Mazar, 2012). As Table 2.2 illustrates, there is low level of participation on the part of the people in the decision-making processes. It also demonstrates instability of the political system. Besides, the political system became characterised by poor performance of state institutions with respect to management, as well as the weakness of the legislation that protects the community and ensures the safety and rights of individuals due to lack of independence. Inequality is witnessed among citizens in law courts when they are tried. There is reluctance regarding the disclosure of cases of corruption in the state and hesitation in the endeavour to detect corrupt elites and to hold those in charge accountable.

Karl (2005) observed that democracy may be a victim of this rentier dynamics. For instance rulers use the petrodollars generated from trading their nation's expansive natural resources to tighten their grip on the people, silence the opposition and form vast military power with repressive tools. This situation is especially endemic amongst oil rich MENA such as Algeria, Iran and Libya, where empirical research has documented a strong correlation between petroleum wealth and despotic rule survival (see, for example, Mahdavy, 1970; Bacher, 2000; Vandewalle, 1998; Wright et al., 2013). In addition, there is evidence that among autocracies, oil reduces transparency because it helps dictators stay in power (Ross, 2011). In addition, as rentier states do not need to tax their citizens in order to support their operations (Hammond, 2011, Gerges, 2013) taxation or rather the elimination of taxation from the economy can often be used as a tool of suppression and control (Kuru, 2002). In short: no representation without taxation. The past regime used its external oil revenues to operate a tax-free society to suppress democracy and retain control of the majority of the population (Meijia and Castel, 2012; Gerges, 2013). For the countries' population, the removal of taxation resulted in a lack of representation and call for accountability or even contesting government activities. Yet, from an outsider, the Libyan regime appears accountable and so it continued to be accepted as such (Mazar, 2012). A number of studies have been conducted about the relationship between taxation and public accountability (Ross, 2001). For example, Crystal (1990) found that revenues earned from oil and gas by the governments of Kuwait and Qatar has made them less accountable to the majority traditional merchant class. In contrast, Brand (1992) suggests that greater pressures for political participation in Jordan increased with decreasing revenue from oil and a drop in foreign aid in the 1980s. Piccolino, (2014) citing Levi (1989) and Tilly (1993) noted that tax collection and accountability has been a defining concept in developing a modern society less dependent on resource wealth.

A- The structure of Libyan institutions and ways forward

Currently, the state comprises three key authorities: the political, planning and executive authorities. At the national level, the General People's Congress (GPC) (equivalent to parliament in Western systems) is the highest political authority in the country. It is responsible for all state political issues and affairs. For example, the Council of Ministers are selected and appointed by the GPC. All state legislations are issued by this authority (Grifa, 2006). Figure 2.4 summarises the structure of the institutions in Libya and their role.



	Structure of state	Role
Governance	General People's Congress	Approves state strategies, policies, and budgets.
Planning	General Planning Council (National Planning)	Studies, suggests and evaluates national strategies and policies.
Executive bodies	General People's Committee (Ministries Council)	Implements social and economic policies, and plans.
	People's Committees in Shabias (Local authorities)	Implements local social and economic policies and projects.
Planning	Planning Council in Shabias (Local planning)	Studies, suggests and evaluates local policies and projects.

Figure 2.4: The main institutions of Libyan state. Source: Grifa (2006)

Grifa (2006) stated that the executive authorities consist of local and national levels of government institutions. The first is the so-called Council of Ministers; it is in charge of managing, supervising and implementing national economic and social policies, together with development plans. The second executive level is responsible for managing, implementing and supervising the economic and social development plans and projects at the local levels in the so-called Shabiat or municipalities (see figure 2.4). The third component of the Libyan state is the authority that is in charge of planning. It is represented by the General Council for Planning (GCP), the highest national planning authority in Libya. It carries out national planning research studies, assesses and approves national economic and social budgets and strategies. This is followed by local councils in the municipalities (Shabiat). These are in charge of conducting and approving local studies. The Planning Council established in 1997 consisted of members of the government and the planning boards of trustees in the regions, including the central bank governor, the directors of the banks and representatives of universities and other institutions. The council is in charge of drawing all economic and social policies, overlooking the annual public budgets, issuing recommendations and submitting them to the General People's Congress (Parliament). The Planning Board looks like a parliament where issues are discussed and deliberated by the various members, but it is not an institution overseeing the planning process. The reason may be due to the large number of its members, where it is difficult to reach a general consensus without a professional secretary who is able to coordinate the proposals and suggestions before drawing conclusions.

In his article entitled, *Libya's economy, capitalism without institutions*, Al-Sawi (2009) pointed out that at the beginning of 2009, a strange policy was implement where all the ministries were dismantled except four: the Ministry of Defence, Security, Justice and External Affairs. Gaddafi allegedly declared this decree to control the state of the economy and to put an end to theft and corruption. It was an attempt to encourage the establishment of private sector companies. Even if this is a good intention, the rent-seeking behaviour that has entrenched the state had affected the growth of the private sector. A number of attempts made in the past to encourage private participation or to liberalise the economy was scuttled by vested interests of the political elites and resulted in reversal of reforms (e.g. dissolution of private ownership in the 1980s). After the lifting of the United Nations Libyan Sanctions in 1999, most of Libya's economy's resources focus on the oil sector, even though the private sector opened up, it is stifled by a number of issues, such as: limited financing to enterprises, poor policy to encourage local and foreign investments, and inconsistency in the application of property rights. Above all, poor economic governance has consistently discouraged tangible investment in all the other sectors apart from oil.

Mazar (2012) Gaddafi who considered himself the '*Guardian of the State*' attempted to empty the state of responsibilities and to delimit its role to sovereign acts; such as justice, internal and external security and diplomatic representation. This runs contrary to what other countries that care for their citizens do. The government is responsible for the economic and social welfare of the people and for securing their rights that include unemployment insurance, health insurance, training opportunities, functional rehabilitation, and social benefits among others. The ministries and institutions should have a strong presence in the community. In many cases, the state intervenes through its political institutions to support companies and help them win deals in other countries. The institutions that are responsible for economic management in Libya are:

1) Political leadership: Gaddafi and his offices.

2) The administrative apparatus of the state: the Prime Minister, Finance, Planning, Economy and Trade Ministers along with the Head of Central Bank.

3) Public sector facilities departments.

Mazar (2012) observed that the political system developed by Gaddafi undermined the central organs of power, the structure of bureaucracy and economic management. In fact, it led to weakening of institutional structure of the state, including private property development and real estate expansion. Gadhafi discouraged investors from investing in real estate and industrial projects since he augmented a slogan saying 'the House is to the one who resides it'. Furthermore, he transferred the Central Bureau of Statistics from Tripoli to Sirte (his hometown) in 1988, a statistical centre similar to that of other countries. The General People's Congress approved the relocation because they are in principle responsible for creating, cancelling, integrating and reorganising these institutions. In reality, however, every action must pass through Gaddafi and every letter submitted by him gets outright approval. Further to this arrangement, no comprehensive national statistics was carried out with the latest statistical annual report issued in 1982. While statistics is an indispensable tool for national development, the absence of current and up-to-date information generation, dissemination and usage about Libya in the past 30 years has indirectly and severely hampered evidence based policy planning, monitoring and evaluation of development programmes and projects.

Tornell and Lane (1999) devised a model displaying how a state with weak institutions, may suffer from a voracity effect when it receives a positive financial shock (such as a resource thriving), whereby influential groups struggle for and waste the bonuses. Robinson et al. (2006) hold similar argument; they observed that when institutions are weak, resource expansions will be wasted through excessive public employment and sponsorship. This is the case in Libya, as 66.67% of the workforce is employed in the public sector (Bureau of Statistics and Census Libya, 2012). Thus, resources are not properly utilised for the benefit of the generality of the people due to the presence of disguised and over bloated public service employment. Vandewalle (2008) did not discern an interaction between the various state institutions that could allow variable views to be fed into the policy making processes. Rather, the collective views they presented would have been either relegated or marginalised within the context of the people's Authority Law No.71 of 1972, which prohibited all political gatherings, movements and activities outside the then approved Arab Socialist Union, which was afterwards dissolved in 1977 and affiliated to the so-called people's congress. The normal official independence of Islamic institutions terminated in 1978 when Gadhafi's regime adopted religious properties and enforced its own perceived understanding of Islam and what a state founded on Islamic law should be on the conventional religious societies.

The planning tasks are distributed between some of these institutions: the Planning Council, the Council of National Planning, the Economic Development Council and the Council of Ministers. In addition, institutions in Libya that are responsible for planning (such as the Ministry of Planning and Finance, the National Planning and Economic Council, the Economic Development Council and the Council of Ministers) have suffered from knowledge gap due to a shortage of technically experienced staff, leading to a situation whereby the institutions are failing to regulate the economy due to limited knowledge and experience on how to do so (Mazar, 2012). The new institutions, in spite of their openness and uncensored outlook, are central in nature; they increasingly depend on a magnetic leader who legitimates his ideology and enforces it. The consequence, as currently experienced is that the central control of Qaddafi's regime left Libya with no adequate public bureaucratic and administrative structures (Chivvis and Martini, 2014). According to Mazar (2012) these institutions interacted over the past five decades in a way that led to successive and overlapping waves of economic regression and stagnation.

Mehlum, et al. (2006) suggests that the impact of natural resources on the country's economic performance is largely dependent on the quality of state institutions: whether or not they are immune to corruption. This assertion was validated in the empirical work of Bulte et al. (2005) and more recently Anthonsen et al. (2012) with both studies indicating that resource wealth is contrariwise correlated with institutional quality measures. Bulte et al. (2005) study explored the effects of natural resources that might be channelled by institutional quality regarding numerous human development indicators by using regression equations. The basic assumption is that human development is influenced by institutional quality and the income of each worker. Findings from this empirical work revealed that institutional quality variables are considerably linked to development indicators - implying that the resource curse indirectly applies to development effects via governance channels. According to them, institutional reforms may serve as a condition required for developing the countries. Rothstein and Teorell's (2008) claim that such quality is best understood as the neutrality of institutions that practice government authority. Anthonsen et al. (2012) hypotheses linked rent dependency outcomes on corruption, legal independence and bureaucratic quality that are empirically tested with data drawn from 131 states or countries, for the period 1984 to 2006, utilising the Feasible Generalised Least Square. The main finding they came up with is that government financial dependency on oil and gas resource rents adversely impact governance quality as measured by corruption indicators, legal neutrality and bureaucratic quality. Furthermore they discerned adverse effects of rent dependency on bureaucratic quality and legal independence.

It is critical now, more than ever, to know that Libya must consider redesigning institutions in an attempt to ensure a post-conflict stable and prosperous nation. Robust political institutions to maintain democracy and the rule of law are clearly essential whereas economic and social structures are required for the prosperity of the country. However, if the experiences of Venezuela and Russia are anything to go by, institutions themselves are also insufficient. Because Libya is plagued by a poisonous mixture of oil-dominated economics, underdeveloped institutions, as well as tribal and ethnic fragmentation exacerbated by the past regime; institutions to manage the interaction of political power and natural resource rents are of priority needs. These institutions should, first of all be in line with what Douglas North (1991:97) defined as "the humanly devised constraints that structure political, economic and social interaction". Institutions that make up a political system are a collection of social factors, values beliefs, rules and organisations that collectively influences, guides and motivates individual and social behaviour (Greif, 2006; Rodriguez and Garcimartín, 2009). Secondly, institutions provide "the sets of working rules that are used to determine who is eligible to make decisions in some arena, what actions are allowed or constrained, what aggregation rules will be used, what procedures must be followed, what information must or must not be provided, and what payoffs are assigned to individuals dependent on their actions'' (Ostrom, 1990: 51).

On the resource rent angle, Libya should emulate either Norway or Botswana. In this case, a certain proportion of the profit from oil should be used in funding future exploration and downstream activities. This is to efficiently manage the sector that has been the source of national income. Most importantly, profits from oil should be deposited in the sovereign wealth fund (which currently stood at US$66 billion) (Behrendt,2015) , but this time not only allowing the independence of the Libyan Investment Authority (an agency charged with the responsibility of managing the funds), but also limiting government to only access the profits realised from these investible funds. A higher percentage of the profit could be reinvested in physical and social infrastructure such as health, agriculture and education, as well as manufacturing that can potentially contribute to self-sufficiency in goods and services, and to other sectors of competitive advantage that diversifies the economy. The rest of the profit could be utilised by government for recurrent expenditure or countercyclical spending at the time of volatile environment. However, transparency is crucial. O'Donnell and Palmer (2011:1) testified that Libyans will "require public disclosure of how Libya manages its oil sector, and disclosure of all revenues associated with it". They further argue that "a transparently managed oil sector could prove the catalyst for much-needed development and stability in the country". This principle will make oil wealth serve the overall interest of the Libyan people. By limiting political access to natural resources, it would not only create firewalls between natural resources and political power, it also force future leaders to keenly seek the support of the people and makes the resource less attractive to accumulate or control.

The creation of post-conflict institutions that could limit political and economic power is achievable, but not without severe contestation. According to Canadian International Council (2011:1), "these sorts' of institutions would force Libya to sacrifice near-term economic flexibility for longer-term stability." The promulgation of a new constitution provides unique opportunities to chart a new course for rebuilding Libya's institutions that would interact with all other organisations, whether internal or external.

According to North (1994: 361):

> "...interaction between institutions and organizations that shapes the institutional evolution of an economy. If institutions are the rules of the game, organizations and their entrepreneurs are the players. Organizations are made up of groups of individuals bound together by some common purpose to achieve certain objectives. Organizations include political bodies (political parties, the Senate, a city council, regulatory bodies), economic bodies (firms, trade unions,

> family farms, cooperatives), social bodies (churches, clubs, athletic associations), educational bodies (schools, universities, vocational training centres). The organizations that come into existence will reflect the opportunities provided by the institutional matrix. That is... if the institutional framework rewards productive activities then organizations - firms - will come into existence to engage in productive activities. "

With the above institutional approach, market forces will begin to manifest. Jansen and Nordås (2004) stated that the quality of institutions has long been considered a significant constituent of a market that functions well. Market activities include interaction between human beings and institutions with the aim of reducing the doubts that arise due to the lack of necessary information regarding the behaviour of other individuals in the human interaction process. Institutions can perform via numerous channels; they can reduce the information asymmetries since they direct information concerning the market status, merchandises and participants; they can also decrease risks since they define and impose property rights and contracts; they determine those who get as well as what and when they get it; they control the activities of the politicians and those of the interest groups, holding them accountable before their citizens. It is pertinent to point out that the effects of resource bonuses on macroeconomic steadiness and economic development are moderated by the quality of the governing political institutions (Arezki et al., 2011). Furthermore, the quality of the democratic institutions is a possible determinant (Lehne et al., 2014). Economic institutions seem to be better in countries that do not have substantial natural resources and that are more economically open to trade, investment and monetary flows. Generally, economic openness and commodity wealth could help non-democratic countries like Libya improve upon their economic institutions.

Khan (2004), discussed the issue of corruption and governance in the developing countries, and pointed out that the tests of economic theory on these workers have shown support for the programs of restructuring the markets, leading to a reduced role of the state with respect to offering a small range of services that cannot be provided by the private sector. However, Kemp et al. (2005) observed that achieving development could not be assumed an automatic wisdom of the market. Perhaps, some Arab countries that adopted the experience of restructuring programs demonstrate clearly the deficit of the automatic market forces to achieve development. This even led to what is reversible: financial corruption and the decline in the state's role in stimulating growth besides the atrophy of democracy and the emergence of a brutal relationship between capital and politics, all in the absence of an interest in human beings. In the Libyan context, good governance should include representation and the establishment of voice and accountability, the strengthening of institutions and people to check and balance government affairs so as to prevent any post-conflict state reconstruction from falling into the previous trend of rent-seeking. Bad performances from a polity and institutions that are inherited from the past may constrain our behaviour, but should be recognised as a history that provided the chance for incrementally modifying these pre-revolution constraints.

The emergence of the so-called Arab Spring in 2011 has provided an opportunity for structural reforms of institutions and to utilise the important lessons drawn from Botswana's resource management strategies. In doing so, new political system and institutions created should be allowed to overcome the legacy of resource curse established by the former regime. Apart from transforming oil wealth to the inclusive growth and development of Libyan's, revenues and institutions would further act as an important source of investment and development drives. According to Kemp et al. (2005), the quest for sustainable development must include the establishment of governance structures and practices that emphasise and coordinate the good works through the creation of attractive factors for a network of interactions across all levels and sizes. As various sectors of the economy are evolving to take advantage of a diversifying economy and changing political and governance system, they become more productive gradually altering any imperfect institutional arrangement.

2.2.3 Economic Dimension

This section draws on examples of countries that have suffered from the Dutch disease by focusing on Libya, Nigeria and Azerbaijan. The Dutch disease describes the negative effect on economies of rich developing countries when their traded goods sector contracts and its contribution to the gross domestic product decreases; it also shows in an overvaluation in appreciation of the real exchange rate. This argument confirms the problem found in the Libyan economy, where the contribution of both agriculture and manufacturing sectors to the GDP has shrunk. For instance, before the discovery of oil, agriculture and animal husbandry were the pillars of the Libyan economy. Allan (1981) states that the Libyan economy was based mainly on agriculture, which employed more than 70 per cent of the labour force and contributed about 30 per cent of the Gross

Domestic Product (GDP)[15]. However, after the discovery of oil, the energy sector began to play a vital role in the Libyan economy, which became heavily dependent on the hydrocarbon industry. According to the International Monetary Fund (IMF, 2012b) hydrocarbons accounted for over 95 per cent of export earnings and it is accounting for more than 70 percent of Libya's GDP. The contribution of the agricultural, forestry and fishing sector was 9.6 per cent in 1962, while the agricultural sector in 2010 and 2011 did not exceed 2.7 per cent and 1.9 per cent respectively regarding contribution to the GDP (Arab Organization for Agricultural Development, 2013).

Jenkins et al (2011) argues that both the North Africa region and the Arab Gulf states are almost dependent on oil/mineral exports. On the other hand, in both Libya and Algeria, these exports constituted about 30 to 60, per cent of GDP in 2007 whereas in Mauritania and the Sudan around 12 to 20 per cent of GDP (Figure 2.5). The figure demonstrates that Libya primarily relies on the export of oil when it is compared to other North African countries, where oil income contributes largely to the national gross domestic product. It seems that the oil sector's contribution to GDP has increased after that accounting for more than 70 per cent of Libya's GDP.

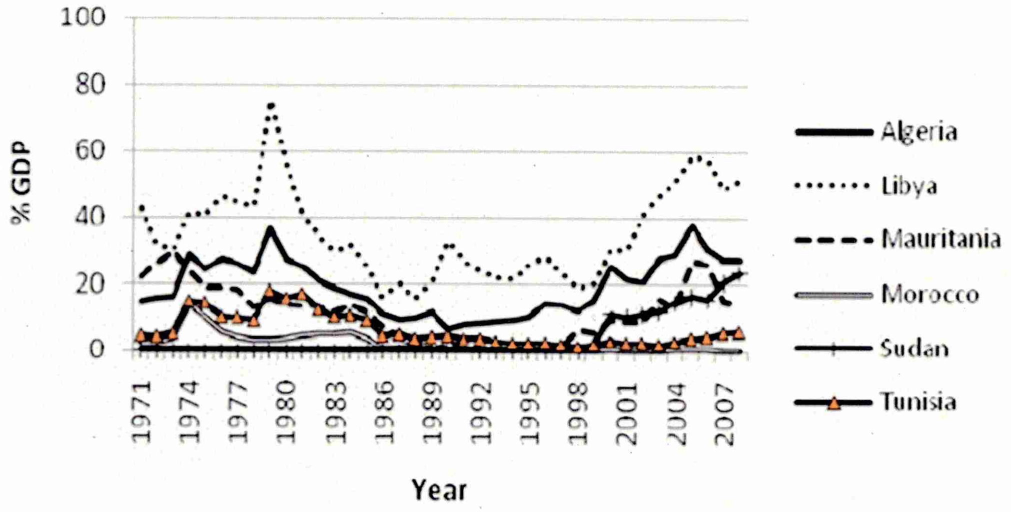


Figure 2.5 Mineral Exports/ GDP: North Africa, 1971 -2008.Source: Jenkins et al (2011) International Rentierism in the Middle East and North Africa, 1971–2008

Karl (2005) anticipated that the Libyan economy had suffered from the Dutch Disease. The reliance on oil incomes and the enormous focus on the oil sectors in the Libyan economy rendered other sectors such as agriculture and manufacturing non-competitive (for more details, see Chapter Three). In other words, the reliance on the oil sectors makes it difficult to diversify the Libyan economic system (Karl, 2005), besides the adverse impact it exerts on economic growth and development. This detrimental effect is evident in several sectors: poor economic performance due to the absence of diversification along with slows growth and inefficient mismanagement; it also negatively impacts investment opportunities. Mayanja (2014) argues that oil dependent nations cannot diversify their economy because they abandon industrialization and agriculture; thus, they become more vulnerable to worldwide economic shockwaves and inefficient policies; they become unable to develop their human capital. For example, in Libya, the high unemployment rates, the growing inflation, the country's poor governance policies and the uneven delivery of wealth were strongly linked to the state's poor administration of its oil income, (Meijia and Castel, 2012). Forward and backward linkages of the sectors and industries are the tools that create economic development in the country. According the theory of unbalanced growth, activities characterized by theoretically highest combined connections should be promoted since they could offer the greatest incentive and inducement to other activities (Hirschman 1958). However, the oil sector lacks linkages that can help developing economies which lack the effective productivity sectors to diversify their economies in areas such as investments in mines since oil wells have very limited connections with the other economic sectors, (Szirmai, 2005).

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[15] GDP is the total value of goods produced and services provided in a country during one year (Oxford Online dictionary).

Kolster and Mejia (2011) pointed out that limited backward and forward integration industrial processes restrict the wealth made by oil riches regarding the exports and financial incomes, whereas they create less than 5% employment opportunities in Libya. They also argued that despite the fact that oil resources had allowed Libya to accrue wealth, the country grieved from numerous macroeconomic anxieties. By 1973, Libya experienced a dual undiversified economy controlled by the government and distressed by ubiquitous rent seeking and supervisory shortages (Vandewalle, 2011). Furthermore, the expenses of pro-cyclical financial policies are not essentially proficient. It became apparent that expenditure often energies spending on the current account but it has a low-return with respect to the public investment programs (Meijia and Castel 2012). The end-consumer electricity bill is twice subsidized since the Libyan General Electricity Company offers funded prices for oil and gas for generating electricity. Consequently, the clients pay less than the real funded price of the supply. Many people do not pay their electricity bills at all. The Monitor Group analysis (2006) serves as an illustration of the inadequacies and losses produced by this system: the (GECOL) General Electricity Company of Libya's transmission and "other" losses amounted to 40%.

Ali (2011) stressed the role of oil production and its repercussions for the Libyan economic development and growth. He emphasized the modification of important macroeconomic variables stemming from oil related shockwaves on the Libyan economic system. The oil income has achieved an upsurge in the need for both tradable and non-tradable goods such as those related to services and construction processes (the expenditure influence). This led to a rise in the local price levels and, in turn, an increase in the actual Libyan Dinar exchange rate (the exchange rate impact). The expenditure impact is controlled by the regime policy-making decisions; most likely they have been the key channels for communicating the oil production effects on the total macro-economy. This is due to the fact that the oil sector is enormously capital-intensive characterized by higher levels of labour productivity; this means that the oil movement impact has been insignificant. However, the part oil production plays in the real GDP is still important to the Libyan economy, besides, it may have had a negative effect on the non-tradable sector. The development in the Libya's GDP by sector requires minor organizational changes that have occurred over the period of current study. That is to say, there has been an increase in the actual gross domestic product which includes the contribution made by the non-tradable sector, like that of services and construction indicating that the oil affluence followed the expansion in the non-oil tradable sector. Nevertheless, it has destabilized the development of the non-oil tradable sectors such as those of manufacturing and agriculture. Oil production and price change exercise a key effect upon the economy in that they allow for foreign asset amassing through the current accounts (current account effect). The result is additional local inflation reflected in higher prices for both tradable and non-tradable goods; this leads to an extra appreciation of the real exchange, Ali (2011). (for further discussion on the Economic Dimension in Libyan economy, see Chapter Three).

In Nigeria, with all its oil wealth, the per capita Gross National Product (GNP)[16] today is not higher than it was at its independence in 1960. Studies conducted on the Nigerian economy consider it a vivid example of economic deterioration. For example, Ogunleye

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[16] GNP is the total value of goods and services produced by a country in one year, including profits made in foreign countries (Cambridge Online dictionary).

(2008) examined the relationship between oil revenues and the level of development in Nigeria through indicators such as GDP and long term economic diversification in manufacturing, agriculture, infrastructure development and private consumption. Results show that there was a positive relationship between oil revenues and household consumption, while oil revenues have a negative relationship with the diversification of agriculture and industries. The importation of goods such as leather that have a competitive advantage led to the killing of leather manufacturing industries rather than strengthening them. However, Nigeria's economy has benefited from an emerging manufacturing sector due to the government facilitating the importation of raw materials and intermediate products at low prices. Thus, the government's policy may have contributed to the industrial sector being the biggest beneficiary of the increasing exchange rates. On the other hand, misguided policies intensified debt overhang problems. Likewise, the Azerbaijani economy shows symptoms of the Dutch disease and the resource curse. According to Shaw (2013), oil exports in 2011 accounted for nearly 95 per cent of the total exports, oil and related commodities constituted 47.8 per cent of the total GDP and manufacturing and agriculture did not exceed 4.4 per cent and 5.5 per cent respectively.

Since 2004, the Azerbaijani economy has shown symptoms of the Dutch disease because of its rapid growth. This resulted from the increase in the energy sector. This has caused inflation and made non-energy exports more costly. However, Azerbaijan is also susceptible to economic recession whenever oil revenues drop. Hasanov (2013), examined the effect of the Dutch disease on the Azerbaijani economy for the period 2000- 2007, and found that its economy suffers from relative de-industrialisation in the tradable sector and a significant expansion in the non- tradable sector. In addition, the flow of oil income has caused deterioration in the tradable sector in comparison to the non- tradable sector. Foreign Direct Investment (FDI) is an influential determinant in shaping the structure of the Azerbaijani economy: 88 per cent of foreign investment is in the oil sector. The share of the oil sector in GDP during the period 2000 -2004 increased from 30 per cent to approximately 60 per cent. If the oil price increase is one per cent, this would lead to a decrease in the production of the tradable sector of 0.889 per cent. Policy-makers should focus on the need to diversify the economy by turning their attention to the development of the non-oil tradable sector: it is this policy that will ensure sustainable growth in the long term. Furthermore, the Azerbaijani economy faces sustainable appreciation of the exchange rate and oil dominated FDI.

Although each of these countries has a different historical and political background, they are vulnerable regarding the long-term changes to their economic structures, namely, they move away from non-oil productive sectors such as manufacturing and agriculture (Al-sabah, 2011). Karl (2005) and Di John (2011) highlighted the importance of diversification to the economy; they argue that investment in the non-oil sector is central to the development of the economy.

2.2.4 Social Dimension

This section discusses three elements: the resource curse; corruption and favouritism and Human Rights. According to Ross (2014), oil wealth leads to corruption and it increases the rate of conflict in middle- and low-income countries. Karl (2005) states that:

> Because the state is a "honey pot," it is prone to capture by powerful interests and to widespread corruption. As a group, oil-exporting countries are significantly more corrupt than the world average (even if Canada and Norway are included).

According to Collier and Hoeffler (2005), large natural resource rents generate immoral governments that are largely corrupt and isolated; they are mainly concerned with plundering for the privileged rather than caring for the ordinary people. Additionally, a rise in backing could nurture rent seeking and corruption among the people, Karl, (2005).

Corruption in the institutions is the most prominent social indicator of the resource curse. The spread of corruption and lack of accountability by dominant groups is common; these groups plunder rather than work. This leads many resource-rich developing countries, controlled by corrupt dictators, to suffer from economic underdevelopment which harms their economies. It also leads to lack of growth and sustainable development. Where conflicts spread and dictatorships rule, institutions are very weak; this can lead to those countries ultimately falling into corruption and underdevelopment or even become failed states (Mauro, 1995; Leite and Weidmann, 1999 Shaxson, 2007;). According to Acemoglu et al. (2004), developing countries suffer under regimes controlled by one person or a group which controls the country. Dictatorships absorb the country's wealth by ineffective economic policies and they are able to secure and sustain their power by creating weak institutions. According to Chaudhry (1994), in order to realise political aims in Libya, Saudi Arabia and Iraq, the respective governing classes proceeded to destroy their country's civil institutions, and the strongholds of the private sector: each state has the means to achieve this.

Furthermore, Sala and Subramanian 2003; and Warner 1995 cited in Bategeka and Matovu (2011) that many countries which have large earnings from natural resources have failed to create a strong economy and are associated with weak state institutions, high rates of poverty, conflict and corruption. Auty (1993) found that countries rich in natural resources did not experience evolution in their economies and suffered from a lot of economic problems and financial crises. The resource curse theory holds that there is constant conflict between the people and the government in these countries and the reason for this is that governments are often authoritarian and do not govern for the benefit of the people. The 40 year dictatorship of Gadhafi created all these problems that ultimately generated the tension that led to the 2011 Libyan revolution.

Libya, Nigeria and Azerbaijan are good examples of the resource curse as they suffer from the weakness of economic performance. It is worth noting that these countries share many features: corruption, authoritarian government and weak institutions. Corruption is one of the endemic social challenges. For instance, Kuru (2002) cites Beblawi (1987) who states that it is hard to distinguish between the Libyan president's pocket and the treasury. In Libya, the previous regime used the money to maintain authority and to fund the military and security forces used to silence the opposition. Li (2013) argues that the unequal distribution of funds and corruption engender revolution; this is inevitable and can not to be avoided. She added that most economists believe that Libya is a textbook example of the resource curse.

Similarly, in Nigeria the poverty rate increased from 36 per cent in 1970 to 64.2 per cent in 2013 due to endemic corruption that led to the disappearance of large parts of the oil income (Persson, 2014). It seems that the Azerbaijani economy also suffers from corruption and faces huge obstacles to doing business and to freedom (Lash, 2002). In both 2010 and 2013, Libya was rated one of the most corrupted countries in the world, ranking 146 out of 178 and 144 out of 177 respectively. Likewise, in 2013, Nigeria and Azerbaijan were ranked, 127 out of 177 and 172 out of 177 respectively (Transparency International 2010, 2013). Figure 2.6 demonstrates that most of the oil-rich developing countries are highly corrupted.

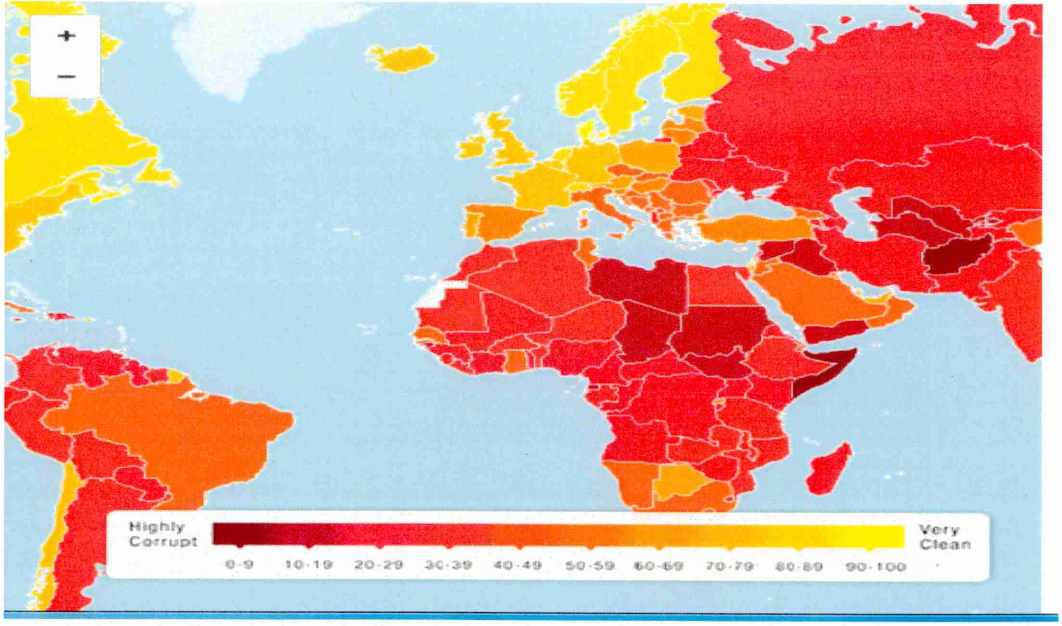


Figure 2.6: Map of Corruption Index 2013, Source: Transparency International.

The spread of corruption, plundering and lack of accountability by dominant groups in many developing countries rich in resources leads to economic underdevelopment. This harms their economies and results in lack of growth and sustainable development. Where conflicts spread and dictators rule, institutions become very weak (Mauro, 1995; Shaxson, 2007; Leite and Weidmann, 1999).

Favouritism is also considered one of the resource curse indicators. According to the Oxford Dictionary, favouritism is the practice of giving unfair preferential treatment to one person or group at the expense of another. Corruption and favouritism weaken the state institutions and render them functionless resulting in the creation of internal violent conflict (Fearon and Laitin, 2003; Fearon, 2005). Those who are favoured distribute the oil income to the people they favour creating inequality, injustice, and discrimination in the society. In a situation like this, only few people can benefit from the wealth and gain access to the oil income which is contracted to them selectively on the bases of personal ties, (Auty, 2001).

According to the Kauffman index (World Bank, 2009) Libya was rated in the 5th and 12th percentile for accountability and government effectiveness respectively in 2009 and 2010 (Mejia and Castel, 2012). Figure 2.7 exhibits that Libya was placed at the bottom in 2010, signifying a principally low level of accountability and reflecting low Human Rights and Human Development records (Meijia and Castel, 2012).

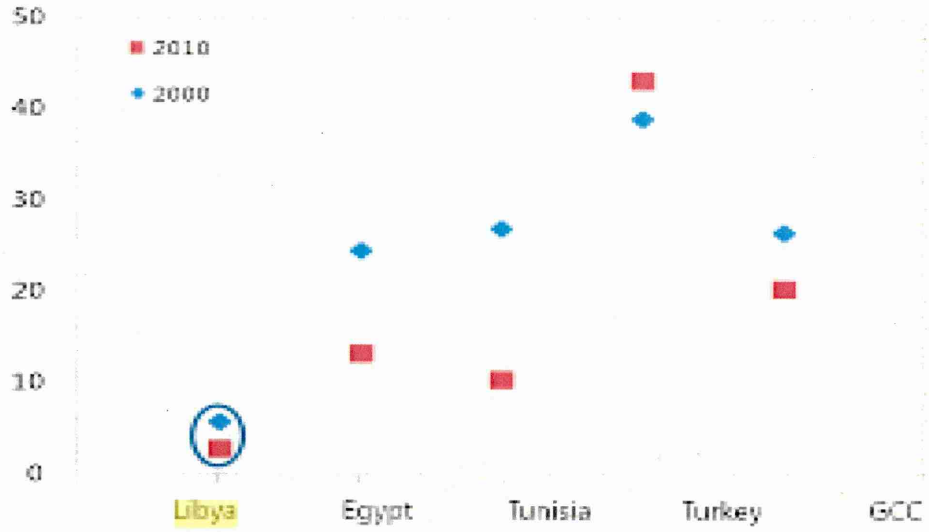


Figure 2.7: Voice and accountability, 2010 (Percentile rank)

Source: International Monetary Fund (2013) Libya 2013 Article IV Consultation IMF.

Regarding the Safety and Rule of Law as well as the Sustainable Economic Opportunity, Libya's performance was also relatively low. Besides, the absence of transparency in government, the reduced citizen representation, and the propensity of the state for rent-seeking seriously impacted the private sector development and consequently impeded economic diversification, (Meijia and Castel 2012). In 2011, a civil war broke out in Libya as a result of human rights absence and economic injustice (Nzemroaya, 2011).

2.3 Escaping the Resource Curse: Experiences from Countries

There is ample evidence in economic history that confirms that the resources of nature have been a boon to many countries. Resources are not a curse in themselves; they may be a blessing when they are synchronised with flexible and successful policy, and when a positive relationship between resource abundance and economic growth and development is built. For example, the United States was ranked first in the world in terms of mineral wealth and still leads the world in manufacturing. Canada and Australia have likewise achieved economic growth and development. Findly and Lundahl (1999) found in their study "Resource- led growth- a long term perspective" that in the early stages of development, mineral resources formed the basis of the economies of Canada and the United States, Norway and Malaysia. Similarly, resource-based products have played a major role in the economies of Thailand and Malaysia, where manufactured exports— simply manufactured, resource-based and dependent on intensive labour—have grown very rapidly (Reinhardt, 2000). Staple theory demonstrates that natural resources can be a tool to stimulate growth and development when the production function of the leading export sector is concentrated on. This theory does not focus much on industry for export but rather on the impact of staple production on the rest of the economy (see section 5.1.1). Therefore, it could be said that resources are not always bad (Karl, 2005). But to benefit from these resources, intense and sustained investment is needed to make natural resource wealth a blessing rather than a curse. Porter (1998) states that the factors of production are the reasons for the beginning of success in the USA, but this was not the only the reason. The USA witnessed intense and continuous investment over long periods to improve the quality of these factors. Therefore, state policy and its flexibility in dealing with the resource boom determines the result of huge revenues from natural resources (Karl, 2005).

Translating resource wealth into prosperity can be traced to state policy, which puts in place plans and strategies suitable for the county's economic, social and political circumstances (Neary and Wijnbergen, 1986). Indeed, government policy has a vital role in leading the state to comprehensive development. Michel Camdessus IMF Managing Director Address to the United Nations Economic and Social Council July 2, 1997, claims that:

> Good governance is important for countries at all stages of development. . . . Our approach is to concentrate on those aspects of good governance that are most closely related to our surveillance over macroeconomic policies—namely, the transparency of government accounts, the effectiveness of public resource management, and the stability and transparency of the economic and regulatory environment for private sector activity. IMF, (1997)

Countries that have large natural resources associated with failed and corrupt management have not taken advantage of this resource wealth, and have not achieved sustainable economic and social development. Indonesia and Nigeria, for example, once had comparable per capita incomes, and both were heavily dependent on oil revenues. Today, Indonesia's per capita income is four times that of Nigeria's (Schubert, 2006).

Indonesia and South Africa are examples of two countries able to diversify their economies and become internationally competitive. To take each in turn, Indonesia is ranked in the top 11 natural gas producers in the Asia-Pacific region, while globally it occupies number 21 in terms of oil production (PWC, 2012). Indonesia has taken advantage of its resources and avoided all elements of the resources curse. It has achieved sustainable development by building an economic base of varied structural productivity. The policies formulated by the state and the capacity to implement development plans and strategies appropriate to its economic and social policy have played a vital role in improving the performance of the Indonesian economy. The Indonesian government does not depend only on the comparative advantage of the oil sector; it has intervened to diversify its economy largely through the development of its industrial capabilities to make it internationally competitive. This was possible because it has added value to its exports, increase productivity and changed the structure of production. According to Zen (2011), the stability of the social and political situation in the five-year plan implemented 1969 - 1975 is considered vital to the implementation of economic development. In this period, the influx of oil revenues did little to encourage foreign direct investment; in the second period, 1975-1981, the government started to use oil revenues to build infrastructure and develop agriculture and basic industries. In an attempt to reduce imports, the government also adopted an import substitution policy. During the economic crisis in the mid-1980s, the government devalued the currency, and the contribution of foreign investment rose. All these factors helped to promote diversification in the manufacturing base.

The Indonesian government prevented the emergence of the Dutch disease in its economy by controlling and devaluing the currency; it thus improved the profitability of the traded goods sector. It also stabilised the state through the establishment of security factors that helped to attract foreign investment. Rosser (2007) stresses that Indonesia's successful avoidance of falling into the trap of the resource curse was due to the changes of power structure that took place and the creation of appropriate economic conditions and economic policy. These in turn provided opportunities for growth. Furthermore, Jomo and Rock (1998) observe that the performance of the Indonesian economy was aimed at long term development. It is believed that the success of the Indonesian experience is due to microeconomic policies being followed in the agricultural markets, credit markets, industries and commerce. The government has made efforts in sponsoring research which is necessary to diversify crops, and provided subsidies, incentives and protection in order to support agricultural diversification. Indonesia has become an important exporter of rice and in adopting a policy to maintain beneficial rice prices has proceeded to stabilise rice prices in the local markets. Further, it has intervened heavily in agricultural market inputs such as seeds, fertilizers and pesticides. The use of foreign exchange for the important production of manufacturing technology has also had a positive impact on its economy. Since the 1980s, government policy turned to promote exports as well as investment in agribusiness and those exports related to agricultural work, such as fish, fruit and vegetables. In addition, Indonesia was able to develop its infrastructure and benefit from the oil money. Sumiarso (2008) points out that the Indonesian government has invested heavily in the development of rural communities. The government took advantage of the significant revenue obtained from the oil boom (1974-1985) and used it for the management and promotion of the traded goods sector. Thus diversification of exports has led to Indonesia no longer relying on oil exports. Its policies are flexible which offers the potential of policy reform as necessary.

In Indonesia; change of political ideology also has a very important role to play. Prawiro (1998) has explained the strong influence of technocratic ministers over economic policy, particularly macroeconomic and fiscal policy during the 1970s and early 1980s.

A further example of successful economic diversification is the state of South Africa. The South African economy held second place, after Tunisia, as the most competitive economy in the African continent and was ranked 45 out of 133 in the Global Competitiveness Index 2009. Government has played an effective role in supporting economic diversification and therefore a very big role in the growth and development of the country's economy (Maré, 2011). It established Sasol, one of the world's biggest companies for liquefying coal for energy in order to compensate for South Africa's lack of energy. The government also established an industrial development corporation to provide funding for strategic projects. This had the ability to develop activities that support economic diversification which otherwise would be unable to run due to lack of funding. The government also focused on strengthening the links between sectors and has sought, through the development of strategic plans, to support economic diversification. These plans work to determine the following for each sector: outlines, key opportunities, constraints, work programmes, main results and tasks for the sector's development. The government in South Africa has also moved further to support the motor industry but some analysts argue that this type of industry is unsustainable and without protection, and that government should instead focus on resource-based sectors which have the ability to compete internationally (Maré, 2011). The government has always sought to create a suitable environment for investment and strengthen links between the countries of the region as well as those of the European Union along with the rest of the world.

Furthermore, (Maré, 2011) also state that the private sector has also played a significant role in the emergence of South Africa as a world power. The private sector was always a bridge between South Africa and the countries of the region, where the participation of South Africa in African economic interests helped it to become a dominant force in the region. Through South Africa's contribution to the development fund for infrastructure in Africa, the development of regional and international relations play a major role in supporting economic diversification and development in many states. South African government policy has created a well-developed Public Private Partnerships (PPP) framework which has helped to facilitate economic activities that are crucial to productivity and growth.

Although the role of agriculture in the economy of South Africa had previously been developed to help achieve this objective, the food crisis that occurred in 2007-2008 strongly revived agricultural focus and the need to regain self-sufficiency despite the challenges of agricultural water shortages and poor soil. The state has continued to insist on the need to enrich agriculture and mining resources, given their great importance to the state's participation in economic diversification, (Maré, 2011).

From the above literature review, it can be seen that translating resource wealth into prosperity can be traced to government of the state because of its responsibility build good institution, puts in place plans and strategies suitable for the country's economic, social and political circumstances.

2.4 Summary

This chapter reviews the literature on the key aims of the research introduced in the last chapter. The literature has pulled together why many oil exporters in the developing countries, including Libya, are unable to create conditions conducive to stimulating economic and social development. It turns out that this wealth has an adverse effect on the overall development in most of these countries – a phenomenon referred to as resource curse in economic and development literature. The consequences of this negative economic and social effect give rise to the so-called Dutch disease that has affected countries like Libya, Nigeria and Azerbaijan. The Dutch disease refers to a situation where the economy becomes excessively dependent on the oil sector but traded goods (e.g. agriculture and manufacturing) shrink thus, reducing the contribution they make to the GDP. This argument shed light on Libyan economic problems whereby both agriculture and other productive sectors contributions to the GDP have shrunk. Because of oil money, Libyan economy over the years lacks the necessary experience of any tradable sector. This is the real challenge that the country encounters particularly during the post-2011 civil crisis development strategy.

The social dimension of resource curse phenomena might lead to the spread of corruption, nepotism/favouritism and lack of human rights in the society and in government and private institutions. In particular, it affects the quality of institutions and undermines their roles in development process; they thus fail to perform their tasks. Weak government institutions exacerbate economic problems. The weak institutions are unable to control the wealth and to assist in the investment of these resources effectively. The spread of corruption and cronyism in the state institutions besides the lack of transparency have worsened the economic situation. The institutions are not competent in handling their affairs since people are appointed in higher offices regardless of their competence. One of the obvious social dimensions of resource curse in Libya is the negative effect on the social and economic aspects of the state; the ruling class attempted to possess wealth and hinders democracy in many ways. For instance, the elimination of taxation has prevented citizens' moral rights to hold government accountable for its actions.

The literature identified numerous economic challenges of oil price volatility. Any sudden change in oil price negatively affects investment and income distribution amongst citizens and creates management problems for the decision makers. Such price fluctuations had a negative impact on the performance of the Libyan economy, particularly in the presence of weak institutions that do not have the ability to respond to these shocks and to address this crisis. The increase in oil prices in the 1970s had significant impact on the Libyan economy and the government policies. There was huge public spending and increased investment in infrastructure by public works and limiting or gradually diminishing the role of the private sector. During the Iran-Iraq war, the Libyan regime tightened its grip on the economy; the role private sector plays in the economy faded away. The collapse of prices in the mid-1980s had an impact on governmental policies; there were signs for encouraging the private sector and privatisation of projects due to lack of funds and the difficulty involved in funding already budgeted public sector programs and projects. Oil price volatility and inflation has impacted the Libyan currency since the commencement of oil production.

One important gap that exist in the Libyan context of resource curse and one that is limited in the literature is the link between food and oil prices. Libya excessively depends on food imports; about 80% of its food is imported from around the world. The February 17/ 2011 crisis has shown the seriousness of this impact and the extent of the weakness and fragility of the Libyan economy in the face of crisis. Libya is not self-sufficient and depends on foreign countries for food security, yet there are sectors that can promote local food production and employment. Food security can be enhanced by reducing imports and by utilising available productive resources efficiently. This highlights the importance of the fishery sector in Libya: it is a sector and an industry that can change the structure of the Libyan economy and can to a large extent contribute to the promotion of food security, because fish contains a highly nutritional value and the value chain can have multiplier effects on the economy, society and individuals.

The chapter shows that political dimension of the resource curse plays a critical role in inhibiting economic and social development in some countries. This manifest by the emergence of authoritarian government models and oil/mineral rents strengthen the grip of the dictatorial rule. The literature further alluded to the influence of leadership ideologies on the economic development of resource rich developing countries, with rentier wealth being seen as vital to the stability of authoritarian regimes. Likewise, the establishment of a system of reward and punishment reinforces tyranny and influence the policies adopted by the state. In Libya, for instance, rentier wealth generated from the countries oil wealth alongside the Gaddafi political ideology played a major role in guiding the country's economic development. All these negative indicators are strongly reinforced by low-quality institutions. In the 40 years of the past regime, they have consistently impeded and weakened public institutions. The damage done to these institutions will take a long time to transform them into a functional role of a diversified economy.

Despite the negative consequences of resource course, the literature review identified examples of some countries, such as Norway, Botswana, Indonesia and South Africa, who despite exhibiting the attributes of a rentier state have avoided the resource curse and benefited from their natural resources by building an economy based on varied structural productivity. The success of the Indonesian experience could be attributed to the microeconomic policies applied; namely, its ability to avoid falling into the deception of the resource curse by initiating changes to its political structures alongside the development of appropriate economic policies. These policies helped to develop and modernise agriculture by increasing investment, which in turn, enhances tradable sector and promotes exports. Similarly, the government of South Africa also played an active role in supporting economic diversification. The government creates both political and economic environment which supported and encouraged investment, whilst also reinforcing economic links with *inter alia* other African nations and the European Union.

From the above, it could be argue that government can assume a direct role in stimulating economic diversification and development. In the Libyan context, which is the case study in this research, uncertainty about a continued flow of oil provides a strong motive for diversifying the economy. Libya is a vivid example of a country that depends on revenues from a single source; its government needs to give serious thought to economic diversification especially in sectors that have highly comparative advantage. This economic model was supported by Ahrend (2008:5) who claims that a country should remain close to the comparative advantage, increasing the depth of its exports, diversifying its production and exporting its natural resources, which are useful types of diversification and development of services in natural resource related areas.

The Libyan revolution provided an opportunity for the country to get rid of the previous inefficient oil wealth management strategies and to improve the Libyan economy keeping in mind that economic diversification is the final objective that needs to be realised. A number of reforms need to be introduced and successfully implemented if Libya wants to achieve success in its economic policies. In the wake of the revolution in 2011, Libya was placed at a crossroad for development. The interim government should have taken advantage of the opportunity available to repair the economy and to make use of the experiences of Indonesia or other successful countries regarding the proper management of their natural resources.

The most important sectors, such as agriculture and fisheries must be encouraged and turned into productive ones that enrich the economy. In this research, fisheries have been chosen as a non-finite resource that can contribute to the diversification of the Libyan economy. Not only does this sector have a comparative advantage, it is not subject to volatility as oil and has enormous potential in aiding economic diversification and food security in Libya. While the literature has catalogued the many faces of the resource and Libya in particular, an important gap exists between diversifying the economy as a measure to counter the curse and the need for food security. This research looks at the mechanics of making fisheries competitive to make it stand as a viable economic diversification strategy, not only in the field of export and in earning hard currency, but also to diversify the sources of income for the population as well as sources of food protein for consumers. Thus, the context of this research is adding a new dimension to the resource curse literature, particularly in countries like Libya that have abundance oil wealth and are suffering from food security, but have the potential to develop the resources. It also reinforces and enriches many viewpoints about resource curse theory. The next chapter presents in detail how Libya became a monolithic economy.

Chapter Three

Historical Account of the Libyan Economy

3.0 Introduction

The total population of Libya is steadily growing, from 5.9 million people in 2006 to an estimated 6.4 million in 2010 (Index Mundi, 2015). However, the average exponential rate of growth of the population has declined to less than 1% since peaking in 1975 at 3.98%. As shown in figure 3.1, estimates from UNDES (2015) indicates that at the end of 2014, Libya's population growth was the lowest among neighbouring countries of Egypt (1.63%), Tunisia (1.1%), Morocco (1.41%) and Algeria (1.84%). Figure 3.1 shows Libya's population growth rate compared to some neighbouring countries. Study carried out in 2010 by number of specialists employed by the government on population policy focused on population growth rates in Libya during the period 1954-2006. They state that there is instability in the rate of growth in the social and economic transformations, and the stages of development of the state. The findings revealed the decline of rate of growth of population in Libya during 1984 - 2006.

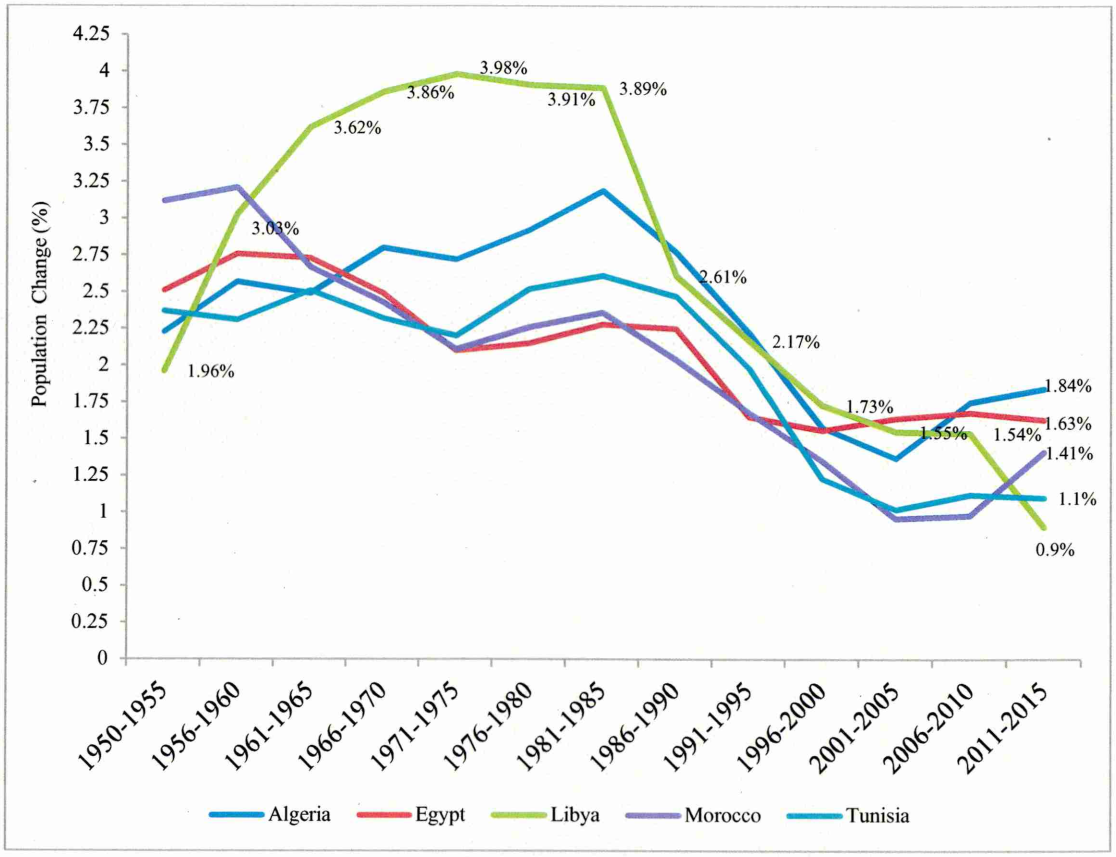


Figure 3.1: Libya's population growth rate compared to some neighbouring countries.
Source: UNDES, 2015.

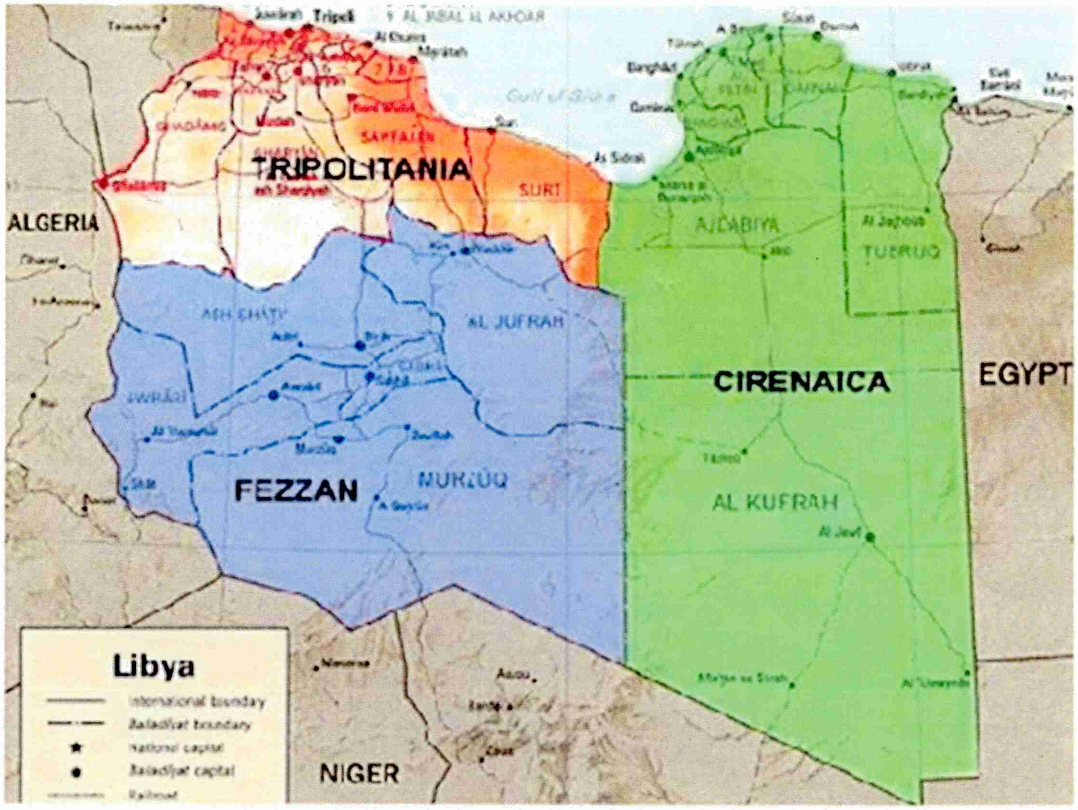
They state that the important reasons are: 1) significant change in the educational status of the population of 15 years and over in particular with regard to the secondary and university education has led to delayed age of marriage. 2) state intervention in determining the age of marriage reducing the minimum age for marriage is 20 years, according to the Law No. 10 of 1984. 3) Lack of availability of housing and job opportunities experienced by young Libyans. 3) The lack of serious studies about balance between the population and what is available to them in human development programme being activated as commensurate with the possibilities of the state and the labour market requirements, (The Scientific Association for Dialogue and Innovation 2012).

Libya's geographical setting has greatly influenced its spatial organisation, economic activities and international relations. Over the past 6-7 decades, Libya has passed through different forms of political and economic systems that all defined the country to what it is today (from Monarchy, to Jamahiriya Libyan Republic and now transiting to democracy). All of these regimes have contributed to the transformation of Libya from a primitive and subsistence agricultural economy that is barely able to feed itself, and so depended on foreign aid, into a surplus wealth economy heavily dependent on the oil sector, both for investment, revenue and for raw inputs (El-Mallakh, 1996). As indicated in chapter two, surplus income derived from oil has made successive Libyan governments to neglect non-oil sectors, which are the most important for long-term growth and development. Discussion on the non-oil sectors and their contributions to the Libyan GDP centres on agriculture, which includes forestry and fishing; manufacturing; construction; and services (health, education, transport, finance and business services, trade, restaurants and hotels, home ownership, public services etc). In so doing, the different influence of the oil boom on agriculture and manufacturing industries (the lagging sectors) and the non-traded goods sector (service sector and construction) was highlighted.

Historically, the Libyan economy has passed through several periods, but for the sake of simplicity, the researcher has covered from the time of Libyan Monarchy rule, through to the Libyan Jamahiriya and up to the ousting of Moammar Gaddafi in 2011. It also covers the post-conflict transition period (from 2012 onward). This division not only show the effect of the political system on the economy, but also cover periods that had both recessions and booms in oil revenues. Thus, it would be useful to see how fluctuations in oil revenue have shaped the proportion of the contribution of other sectors to GDP. In the second part of this chapter the need for Libya to be self-sufficient in food was extensively analysed. This is to justify why developing fisheries would not only lead to solving food problems, it would also contribute to a large extent on any diversification drive.

3.1 The Libyan Monarchy (1951-1968)

Libya evolved as an independent state at the end of World War II upon a request from the Super Powers. Since its autonomy in 1951, Libya was a poor country and has depended almost entirely on agriculture and externally derived capital (Ghanem, 1982). At the time of independence, the Libyan kingdom, ruled by King Idris, comprises the three distinct provinces that have for thousands of years persisted in maintaining separate identities whether politically, economically or socially (Vandewalle, 1998, Mazar, 2012). These three provinces are: Cyrenaica to the east; Fezzan in the southwest; and Tripolitania to the northwest (see figure 3.2). These generational divisions are demonstrated in the current conflict, where each region wants to have an overwhelming control of the country's leadership and resources. In 1951, Libya approved a constitution, written by a committee of 60 representatives with equal number of representation from the three provinces in figure 3.2. Despite the division among these provinces, the King substituted the federal system of government with a unitary one in 1963 (Vandewalle, 2006). On 26th April 1963, the King announced the end of federal system after Prime Minister Mohieddin Fikini amended the constitution that was approved by the House of Representatives, the Senate and the Legislatures of Libya's three provinces (Al-Jazeera Centre for Studies, 2012).


Tripoli
AL JABAL AL AKHDAR
Gulf of Sidra
TRIPOLITANIA
SURT
ALGERIA
AJDABIYA
TUBRUQ
ASH SHATI'
AL JUFRAH
AWBARI
CIRENAICA
EGYPT
FEZZAN
MURZUQ
AL KUFRAH
Libya
International boundary
Baladiyat boundary
National capital
Baladiyat capital
Railroad
NIGER

b

Figure 3.2: Cyrenaica -Tripolitania and Fazzan Regions. Source: Michael (2013)

Following the constitutional amendments, Libya became a monarchy under King Idris Snoussi, who ruled from 1951 to 1969 (African Union, 2013).

Before 1953, Libya was thinly populated (1.32 persons/sq.km) (Kezeiri and Lawless, 1987). The highest growth in population occurred during the period 1954 to 1975 in the two densely populated districts: Tripoli (169%) and Benghazi (147%). At the time of its independence, Libya encountered huge economic and social challenges (Farley, 1971). It was one of the world's poorest countries, where two-third of the population engaged in agriculture, industrial sector was limited, due to a lack of raw materials, technology and manpower. There was housing shortage, a lack of facilities and families live in traditional settings (Anabtawi 1960). From a state perspective, the miserable economic situation was worsened further by the absence of government institutions and poor co-ordination of the sectional arrangement in place. For example, besides the government at the centre, each of the three provincial governments has its own representative assemblies, ministers and executive offices with three capitals besides a winter capital in al-Baydha, where the first monarch resided (*ibid*). The period, from 1951 to 1961, was characterised by continued poor economic growth and financial deficits, largely depending on financial aids from western donors to help provide food and other assistance that would leap Libya out of poverty. Libya also enjoyed foreign assistance that includes technical, financial grants, infrastructure and manpower in developing the country's petroleum assets (Allan, 1981). Because the political system is constitutional monarchy, it ended up being concentrated in the hands of family members, and the factional tribes who were part of the government to protect the interest of their people. Government positions were also occupied by close relatives and their favourites who were favoured by the awarded of contracts (First, 1974). Since Libya's independence in 1951, the administrative and economic structure was built by people who have little or no practical experience but are drawn-in based on tribal sentiment or lineage with the royal family (Alan, 1981). Oil was discovered during the reign of King Idris in 1958. This discovery has rapidly changed Libya's economic situation and development process. For example, since the development of the petroleum assets from 1960 up to 2010 Libya feature a capital-surplus economy and represent a growing market for service in North Africa. Foreign exchange reserves generated through oil export has in turn allowed Libya to implement vast (*and sometimes unsustainable*) infrastructure development (The African Development Bank Group, 2011).

3.1.1 The Libyan Monarchy and its Economic Development Plans

Libya has witnessed a huge change in its economy since it gained independence. A study of the Libyan economy during monarchy reign can be divided into four main periods, defined by economic and political factors.

1- Libya before oil discovery and at independence (1951-1961)

Before the discovery of oil, Libya was one of the poorest countries in the world according to the United Nations reports (Clarke, 1963). At the time of independence, illiteracy was prevalent, and there were very few skilled and qualified workers and technical and management expertise are almost absent. The national life was represented by nomadic or semi-nomadic lifestyle; the nomads roam the country and they never get settled; the poor living conditions and the high birth-rate added to the misery of the country (Edwik, 2007). He added that the swift population growth stretched the agricultural economy; the result was a surge in unskilled labourers' migration to the cities, which, in turn, lacked adequately-paid working opportunities. During the 1950s, and the early 1960s, the United States, Britain and Italy continued to financially bridge the gap between Libya's needs and its internal resources (Edwik, 2007). Higgins (1953) observed that the United Nations shouldered responsibility for supporting Libya to realise higher standards of living since the creation of independent Libya. The international community could not, however, assume sustained development programme that could enable countries to develop self-sufficient economies immediately. During the most part of the 1950's, Libya's administrative cadre could not exploit all the resources that are made available from outside (Edwik, 2007). Agricultural production was mainly concentrated in the mountainous region of the country as the sandy areas by the coast are dry and require artificial irrigation for cereal production. Cyrenaica region, which has coastal mountain ranges and plateaus, has different combinations of climate suitable for agriculture and pasture. The Gulf lying between Tripolitania and Cyrenaica is suitable for seasonal grazing, likewise the southern part of the Gulf. The Sahara towards the southern part of the country is barren, unbearable to humans and unproductive for crop production, except animal husbandry. Pastoral and agricultural communities foster economic cooperation with neighbouring towns and villages through trade and commodity exchange. Local nomads were relied upon to supply meat, wool, hides and clarified butter to the towns either for individual consumption or industrial usage as raw materials. In return, towns provide them with consumable goods (El-Fathaly and Pamer, 1980).

Libya's total GDP did not surpass LYD 5.5 million by 1955. Allan (1981) pointed out that the early years of independence preceding the oil incomes (1951-1961) brought about an upsurge in external funds allocated for development. Numerous agencies for overseas aid like the Libyan Public Development and Stabilisation Agency (LPDSA) handled such tasks; the agency is primarily a British organisation, besides other large number of US agencies that include the Libyan American Reconstruction Agency, (LARC), the Libyan American Joint Services (LAWS) and the Libyan American Technical Assistance Service (LATAS). These agencies collaborated in consultation with the Libyan federal government to implement public works and agriculture development programmes. The following tables (3.1 and 3.2) show how Libya relied on foreign aid to finance more than half of its expenses and Libyan Trade Balance 1950-1960 respectively (Sheibani, 2008).

Table 3.1: Libyan Sources of Public Finance from 1954/55-1958/59 (Thousands of LYD)

Item	1954/55	1955/56	1956/57	1957/58	1958/59
Expenses	7,897	12,978	15,433	17,031	19,179
Local revenue	5,549	7,061	8,147	9,595	12,049
Foreign aid	5,641	6,270	4,234	12,069	11,045
Total	11,190	13,331	12,381	21,664	23,094
Balance	3,293	0.353	-3,052	4,633	3,915

Source: Sheibani (2008).

In addition to foreign aid, the Libyan economy depended heavily on agriculture (both livestock products and crops). Foreign aid and agriculture made up about 52% of GDP (Allan, 1981; Alafi, and Erik, 2010). Agriculture and animal husbandry were the pillars of the Libyan economy, with over 80% of the Libyan population engaged in agriculture and animal husbandry according to a report drawn up by the mission to Libya in 1952 (United Nations, 1952; Al-chukhucka, 2003). Metz (2004) maintained that before 1958, agriculture contributed 30% of the GDP, and supplied raw materials for the industrial sector, trade and exports, even though the agricultural land in Libya does not exceed four per cent of its total 1.76 million km^2 area. Agriculture faces difficult challenges and productivity has suffered from inadequate rainfall (with less than two per cent of areas receiving more than 200 ml of rain), soil erosion, high temperature, drought, desertification and water scarcity. For example, the drought prior to and up to the 1970s brought starvation and poverty to the people (Allan, 1974).

Table 3.2 Libyan Trade Balance 1950-1960, In US$ m

Year	Total Imports	Total Exports	Trade Balance
1950	19.55	10.58	-8.97
1951	33.71	13.22	-20.50
1952	32.59	12.46	-20.13
1953	31.81	9.74	-24.86
1954	31.35	10.75	-20.61
1955	40.26	12.86	-27.40
1956	46.48	11.63	-34.85
1957	78.61	15.16	-63.45
1958	96.60	14.21	-82.39
1959	113.64	12.04	-101.60
1960	169.08	11.29	-157.79

Source: Central Bank of Libya, 1976

According to United Nations Report (1952), a large-scale industrial sector at this period was limited, due to a lack of raw materials and technical ability. However, there was a variety of informal and small-scale industries: flour milling, olive oil refining, tobacco, salt, textiles, footwear, clothing and workshops, vehicle-repair, printing and preparation of fish, soap making, fruit and vegetable canning, wine making, and soft drink manufacturing, with an approximate workforce of 15,000 to 20,000. These industries constituted 10% of the gross national income. Most of the industries were located in the city of Tripoli and its suburbs and were run by Italians. It is worth stressing that agriculture and foreign aid, in addition to small-scale manufacturing, were the backbone of the Libyan economy. Agriculture, despite environmental conditions and a difficult climate (mentioned above), was a strong element in the structure of the Libyan economy, in terms of providing a livelihood and employment opportunities. In reality, farming was the main source of the country's income before the discovery of oil (Wright, 1969). In the first 10 years of independence, the ailment in the agricultural sector became more visible; so state spending on agriculture and irrigation was enlarged almost 10 times. Although the importance of agriculture for the economy is evident, it remained largely subsistence, and according to state evidence in 1963; it was plagued by adversities which symbolised worst form of underdeveloped situations (Farley, 1971).

According to Allan (1981), the first phase between 1951 and 1961 was marked by low levels of economic growth and a predictable dependent role towards Western interest, whether or not articulated on the level of aid. The first phase of the plan was for a period of six years; it was envisioned that it would be followed by three extra six year plans which focused on agriculture research, training, education, experimentation, and improvement. The first plan also took into consideration repairing public works, second war damage and community utilities. Furthermore, it envisaged the inclusion of manpower into the community development projects, an over-growing import surplus, dependence on international monetary and technical assistance, huge budget deficits, the restraint of population growth as well as capital accumulation (Farley, 1971). According to Alan (1981) the objectives were unfamiliar since they do not concentrate on industry; besides what is expected from agriculture was limited. The second phase of the plan was to embrace the periods of second and the third six year plans. The thrid phase of the plan was to promote light industries that are less capital-intensive and produces end-user products. The aim was to use these industries in the processing and value-addition of agricultural products so as to reduce import, deficit reduction, minimise foreign aid, while increasing capital accumulation (Alan, 1981). The third phase was to enhance the development of phase two industries, realise a balanced budget and become independent of foreign assistance. Unfortunately, only the first phase development plans could be realised. There were unexpected events that emerged beyond the control of all those concerned with the economy within the following 10 years *(ibid)*. Otherwise, the country could have envisaged 24 year plan up to the end of the fourth phase. It was the unpredicted factor of oil revenues which brought about this and not the foresight of the planners or the proper implementation of the plans.

King Idris vision was limited; he had no experience and he was unusually flexible with respect to welcoming, accepting and honouring donor ideologies, thus allowing the intervention of aid providers in all aspects of Libyan life. In reality, no Libyan institution got the opportunity to evolve so that it could participate in the process of planning because international agencies expertise were relied upon to constitute and run state institutions (Allan, 1981). In general, the lack of stable and sufficient sources of financing has greatly hindered government development plans. The emergence of oil in the 1950s has contributed significantly to planning, despite overall environmental and economic insecurity, and the impediments to the development programs imposed by the evolving constitution (World Bank Mission, 1959; Anabtawi, 1960). Unfortunately, Allan (1981) recognised that the Libyan people were exonerated from participating and contributing to the development processes that affects them.

2- From Oil Discovery and Production to 1969

The comparative advantage of Libya's location on the Mediterranean made it attractive to oil companies because of: 1) limited supply of oil due to the 1951-1954 Iran political crisis (Encyclopedia of the New American Nation, 2015); 2) the closure of Suez Canal due to the Suez Crisis of 1956-57 (Abdelrehim et al., 2008); 3) reduction of transport cost; and 4) Libya was a politically stable country with pro-Western ideologies in governance (Alan,1981). By 1957, there were a number of multinational oil firms, such as Amerada Hess, Conoco, Shell, Chevron and Mobil wanting to operate on about 60 oil concessions mapped from successive drilling. The first commercial oil exploitation was made by ESSO (subsequently Exxon) in 1959 (Chapin, 1987). Till 1961, the Libyan government was engaged in making its own institutional and administrative arrangements to manage the new situation (Allan, 1981). Libya joined the Organization of Petroleum Exporting Countries (OPEC) with the commencement of oil export to European markets in 1962. As figure 3.3 shows, Libya's proven crude reserve, which stood at 48 billion barrels as at 2014 is the largest in Africa. Apart from oil, Libya has the fourth-largest amount of proved natural gas reserves on the continent (Oil and Gas Journal, 2014). According to Masoud (2013), activities in the petroleum sector accounts for about 30% of the total local product and constitutes the prime resource of currency. From the early 1960s, while the development of oil industry was remarkable in terms of making available the revenue used in financing rapid expansion of infrastructure, the sector was slowly dominating the national economy. Various socio-political and economic plans were drawn up; however, only one plan was implemented by the former Libyan regime (the Monarchy) after oil discovery because those plans were ignored by the Revolutionary Command Council which took over in September 1969 (Allan, 1981).

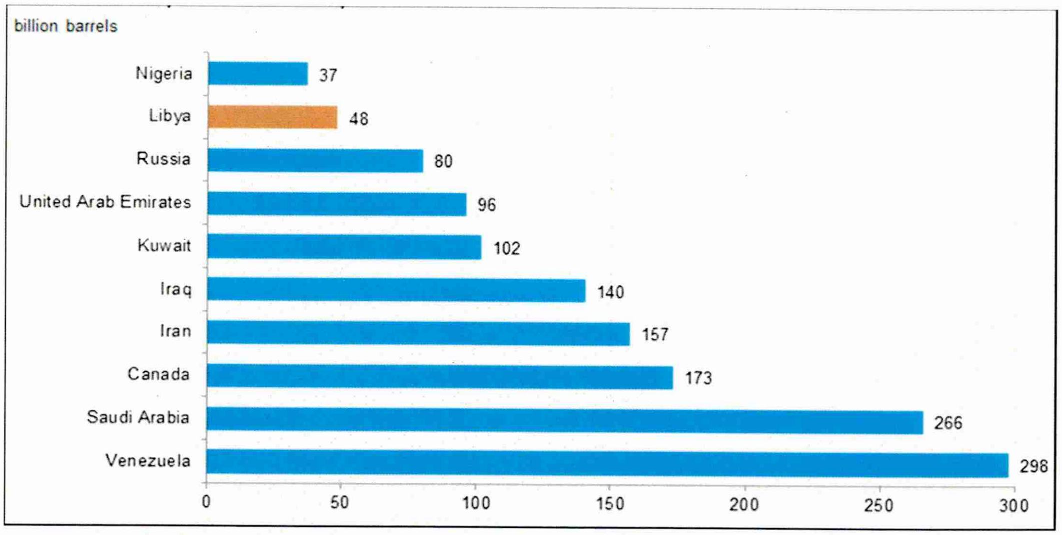


Figure 3.3: Proven crude oil reserves from top 10 countries.
Source: Oil and Gas Journal, 2014

A- The Development Plan (1963-1968)

The First National Development Plan (1963-1968) for economic and social development was based on oil revenue forecast. The plan was drawn to realise the following national priorities: (1) reduce the role of government in order to promote and support the role of the private sector; (2) improve on standard of living; (3) modernise agriculture and (4) provide education, health, communication and housing (Ghanem, 1987). Based on projected oil revenue, about LYD 551 million (about US$ 1.5 billion) or considerably more was spent to finance this plan. The plan allocated LYD 29.275 million or 17.3% of the total budget to modernising agriculture (Allan, 1981). Infrastructure investment was made in agriculture, including environmental research, institutes and colleges, rather than on actual crop or food production. Further investments were made in capacity building of craftsmen so that they could compete with imported goods (Ghanem, 1987). According to Allan (1981), the first economic plan provided the foundation for the growth of some small-scale industries. It has made an impact: agricultural and industrial output increased. Oil production increased rapidly and it gradually became the motor driving the economy. As the development plan had envisaged, the standard of living and the average income grew steadily. For example, the average Libyan household income in 1955 was less than LYD 20; it rose to between LYD50 and LYD100 towards the end of 1960s. As at 2011, the average household income has risen to more than US$14,000 a year, with the lowest household income of around US$400 per month (Walt, 2011).

However, failure to observe spatial development in the allocation of resources has clearly impacted agriculture. The economy demonstrated signs of conspicuous inequalities in the distribution of income, among both the people and the diverse economic sectors and geographical locations of the country (Ghanem, 1987). There were hardly any changes in upgrading the dilapidated amenities or providing new ones in the villages where most farmers. Low agricultural wages that were unable to compete with other sectors resulted in mass migration of young farmers to the cities of Tripoli and Benghazi in search of better opportunities. The number of workforce in agriculture decreased dramatically: from 50% of total employment in 1963 to 30% in 1969. This was mainly due to the migration of local farmers and workforce to the coastal areas to search for public sector jobs (Allan, 1981). By 1968, the Libyan agricultural production could not be maintained without outside labour, mainly from Tunisia and Egypt. For example, the north-western Libyan agricultural production relied heavily on Tunisian-migrants labour, whereas the north-eastern Libya agricultural production depended to a large extent on Egyptian-migrants workers (Allan, 1983). At the same time, corresponding increase in income and population led to increased demand for food and other consumables, whereas local production of food and other consumables could not meet and cope with people's needs (Mazar, 2012). To bridge the supply deficit shown in Table 3.3, attention was focused on the external market (Allan, 1981). Subsequently, food imports increased dramatically during the first six years (see Table 3.3 below). Despite increasing reliance on the foreign market to fill the gap in domestic demand, the government did not involve itself in the hope that an invisible hand would interfere and correct the course of the market; this hand would also create, in the long run, a healthy environment that could serve economic development by applying a free enterprise system (Ghanem, 1987).

Table 3.3: Total Imports and Food Imports in Libya, 1963- 69 (million LYD)

Year	Food imports	Total imports
1963	10.2	85
1964	13.4	104.5
1965	16.2	114.4
1966	19.7	144.7
1967	26.3	170.0
1968	27.6	231.3
1969	30.7	241.4

Source: El-Wifati (1987)

The oil sector is indirectly related to the other sectors (such as health, education, building industry, construction, agriculture, etc) and the revenue generated from oil and natural gas meets the growing spending on these sectors. Oil revenue provides the economy with foreign currency that enables the country to import commodities, provide services and carry out exchanges. Table 3.4 illustrates the increase in spending on the economic sectors for the period from 1962- 1967. However, the realisation of the above objectives under the first national plan was unimpressive due to environmental factors, unskilled labour, and a lack of expertise in mechanised agriculture and poor synergy between the regulatory government agencies (Allan, 1981).

During the First Development Plan, the Monarchy has not paid particular attention to fisheries in spite of the tremendous potentials abound. Table 3.4 displays total expenditure in the development plan, 1963-1967.

Table 3.4: Total Expenditure in the Development plan, 1963-1969 (million LYD)

Sector	1962	1965	1966	1967
Agriculture & animal	1.3	7.2	10.1	17.3
industry & minerals	0.1	2.0	4.7	7.4
Electricity	1.7	3.7	5.8	14.1
Transport & communications	4.4	12.1	23.0	6.8
Housing & utilities	4.1	12.1	23.0	42.1
Education	0.6	5.6	10.7	8.1
labour & social offices	0.7	3.5	3.4	5.3

Source: Ghanem (1987).

According to FAO (1995), although Libya has fishery sources with an ancient history of human settlement, the traditions of fishing and fish consumption are not particularly strongly instilled as features of a contemporary national society. On the other hand, there was a relative abundance of fish at that time, and the per capita was then up to approximately 3.5 Kg per year (noting the small number of the population, 1.428 million) (AL-Arbah 1996). It looked like that the policy of government during King Idris rule sought to stimulate the population appetite for fish consumption. For example, as part of the school nourishment program, students in primary and intermediate schools received canned sardines and tuna for breakfast during the 1950s and 1960s (AL-Arbah 1996). Until fairly recently, much of the artisanal and small trawler fisheries were carried out by Italians and Maltese based in Tripoli and a few other major ports, whilst the Greeks were especially active in the sponge fishery. AL-Arbah (1996) stated that the fishing industry sector did not receive due attention from the state in the 1950s and 1960s, since the ports, harbours and factories were not available at that time neither were other basic facilities. Fishermen relied on self-effort and on their individual abilities. Fishing was not properly protected from the greed of ship-owners and fishing boats, as well as the tuna fisheries were dominated by the Italians who exploited them for their own interests. Table 3.5 below shows the quantity of fish production covering 1951-1955.

Table 3.5 fish production in tons over the period 1951-1955

Year	fish production / tonnes
1951	960
1952	1440
1953	600
1954	1070
1955	1230

Source: FAO (1958) Report to the Government of Libya on the present situation of the Libyan fisheries, February-August 1956.

With increase in oil revenues, successive governments became guilty of financial and administrative corruption considering that few individuals have prevented the revenue from reaching the majority of people (Alan, 1981). Government officials were accused of embezzling oil revenues and diverting some for themselves (*ibid*). Therefore, Libyan economy assumes the status of a rentier state (see Chapter two for more details). For example, according to the African Development Bank (2014), the discovery of oil reserves in 1959 has enabled Libya, one of the world's poorest nations, to become an enormously rich state, but at the same period it also witnessed a rise in strong dislike over the augmented concentration of the nation's affluence in the hands of elites. The negative impact of the Libyan oil revenues on the economy was predicted by Clark (1963). His paper warned that there would be real danger of the superimposition of an oil economy upon the traditional rural economy, and that wealth, power and economic institutions would be concentrated in few hands. That is exactly what is happening to the Libyan economy. Clark (1963) clarified that dependence on oil would threaten Libya's economy, pointing to a number of changes in the Libyan economy after the discovery of oil. These changes were: increased consumer spending and demand for imported goods. As a result, government spending rose, food prices and inflation increased significantly. As for the private sector, the relationship holding the public and private sectors was an active one up to 1969. However, this developing mutual dependence weakened markedly after the revolution. One can note that government reinforced control and numerous forms of nationalisation reached most economic enterprises (Allan, 1981).

❖ Gross Domestic Product (1962-1969)

Libya witnessed an important event which caused unprecedented high oil prices (as seen in section 2.2.1), namely the banning of the sale of oil by OPEC states in 1973, states in which the price of oil increased dramatically and thus brought about a revenue boom in the mid-1970s. The expenditures on agriculture doubled more than 12 times: they were only LYD 1.3 million in 1962 but exceeded LYD 13 million in 1969. Nonetheless, what was generated from the productivity sectors fell remarkably. For example, Agriculture, Forests and fishing dropped from a GDP contribution of 11.5% in 1958 (Wershfani, 2003) to 1.8 % in 1962, 0.2 % in 1969 (Mazar, 2012). Table 3.6 demonstrates the increase of the oil sector's contribution to GDP comp

Table 3.6: GDP in oil and non-oil sectors from 1962-1969 (LYD Million), 2010 price

Year	Agriculture, Forests and fishing	Oil Sector	Manufacturing	Total GDP	Agriculture, Forests and fishing %	Manufacturing %	Oil Sector %
1962	205	10272	32	11134	1.8	0.3	92
1963	204	23463	34	24408	0.8	0.1	96
1964	198	42953	37	44105	0.4	0.1	97
1965	273	56605	39	58129	0.5	0.1	97
1966	260	69576	44	71301	0.4	0.1	98
1967	274	75217	50	77253	0.4	0.1	97
1968	261	113561	60	115891	0.2	0.1	98
1969	267	136541	62	138877	0.2	0.04	98

Source: Sheibani (2008)

Table 3.6 shows that the share of agriculture output in real GDP declined from 1.8 to 0.2% during the period 1962-1969 and the share of manufacturing output declined from

0.3 to 0.04% during the same period. The members of the Revolutionary Command Council attributed the reason for the diminishing role of the agriculture and industry in the first eight years of oil revenues to the inexpert, but mainly the corrupt, management of the regime (Allan, 1981). This resulted in economic imbalances which gradually damaged the structure of the Libyan economy; it is, in fact, one of the Dutch disease symbols. In addition, corruption and controlling the economy by the oil sector marked the beginning of transferring the state into a rentier system. Thus, agriculture contracted intensely and manufacturing was weakened relatively, (*ibid*).

According to Asciak (1964), fishery marketing and demand in this period is not well-articulated. There is no organised marketing system at the wholesale level and fishermen are dependent on few fish merchants to dispose of their catch. The merchant is often in a position to dictate his own terms and to exploit fishermen unduly. This is especially the case with those fishermen operating in areas along the coast; they depend entirely on the merchant for transporting their fish to Tripoli and Benghazi. For the demand: the present level of fish consumption in Libya is very low compared to that of other neighbouring countries. The reason usually attributed to this low consumption is the high price of fresh fish. This is very often not the case, especially in summer, when fish prices are generally lower than those of meat (*ibid*).

Increased production results in lower prices, but the lowering of prices alone is unlikely to be enough to change the eating habits of the people and to make consumers prefer fish to meat. It is not true that the Libyan population have any innate dislike for fish but it is a fact that most Libyans have never been accustomed to eating it. This assertion has been extensively dealt with in chapter nine. For example, fishing methods in the 1960s were regarded as traditional and primitive – daily catch was as low as 10kg compared to the average 100kg in neighbouring Mediterranean countries. Fish processing was generally poor and ill-equipped, and confined to the coast of Tripolitania (Allan, 1982). Where they are found, they are associated with the development of the Tunny fisheries. This sector of the industry needs to be upgraded and encouraged wherever necessary. Canned fish forms a convenient alternative to fresh fish in areas far from the coast and along the coast during periods when the supply of fresh fish is low. Most canning factories are equipped with antiquated equipment and the prevailing hygiene is of a very low standard. Improving the existing processing plants and erecting new processing factories should be assisted financially. No provision was made for this purpose in the fisheries development plan because it was considered a financial assistance that can be given under the scheme for providing loans for industrial purposes. The following table (3.7) shows the size of the fish production during the 1962-1970 where production looks very modest.

Table 3.7 fish production in tonnes over the period 1962- 1970

Year	Quantity/tonnes
1962	1500
1963	1400
1964	1600
1965	2924
1966	3324
1967	4236
1968	5560
1969	6500
1970	5500

Source: FAO - Fisheries and Aquaculture Information and Statistics (2015)

The Libyan government requested the services of a fishery administrator to assist the fisheries in its formative stages and in the planning of its program. Since the assignment of Mr. John, FAO fishery Economist, the following developments took place: 1) Ministerial order No 1 issued by the minister of national economy authorising the setting up of fisheries office within the Ministry of National Economy in 1961; 2) the Libyan government had entered into a bilateral agreement with the government of the Federal Republic of Germany for technical and economic co-operation. Under this agreement, German government provided equipment and technical assistance for the development of Libyan fisheries. Meanwhile, the Libyan government had purchased a motor trawler and Mansoura to be used to train local fishermen in trawling techniques and in 1962, FAO organised a training program for fishermen in Benghazi. This demonstrates the important role of the government in stimulating the economy. Apart from the fisheries office in the Ministry of National Economy, there was one official in the Ports of the Province of Tripolitania and Cyrenaic. These two officials were concerned mostly with the issue of fishing licenses (Asciak, 1964).

Figure 3.4 below describe the organisational structure of fisheries in the era of the Kingdom of Libya.

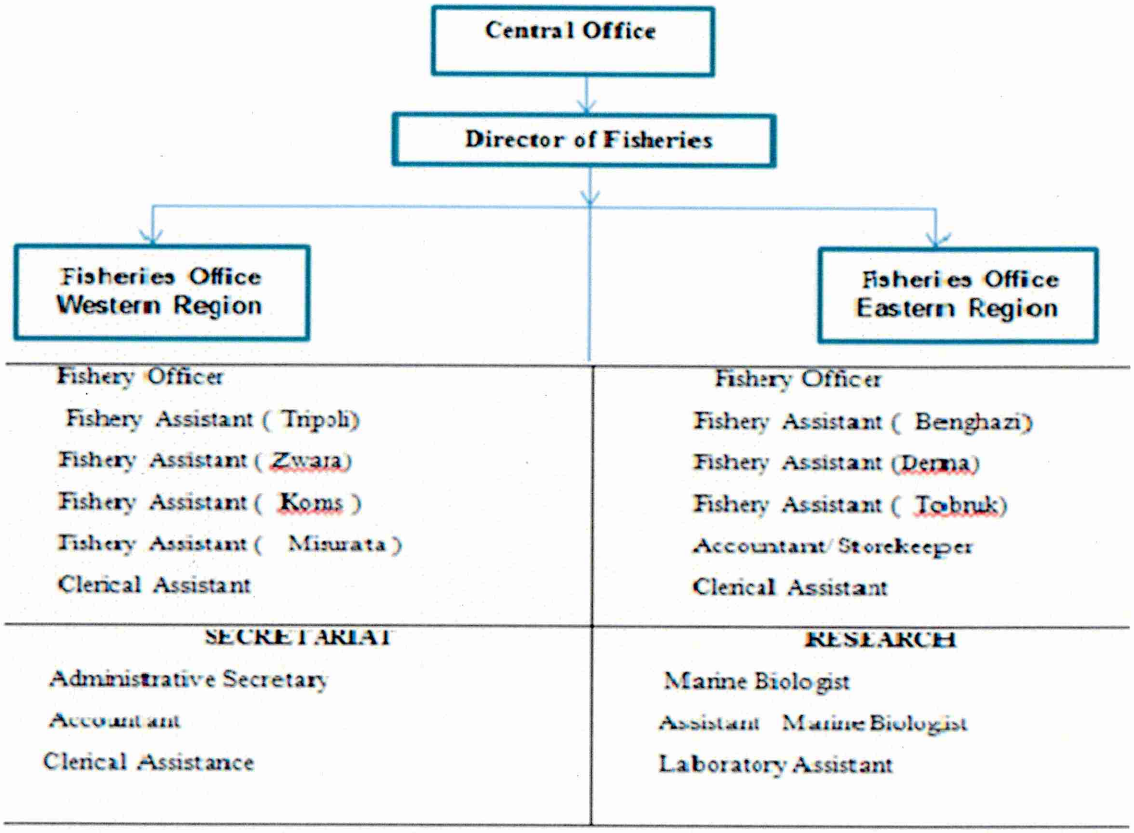

Central Office
Director of Fisheries
Fisheries Office Western Region
Fisheries Office Eastern Region
Fishery Officer
Fishery Assistant (Tripoli)
Fishery Assistant (Zwara)
Fishery Assistant (Koms)
Fishery Assistant (Misurata)
Clerical Assistant
Fishery Officer
Fishery Assistant (Benghazi)
Fishery Assistant (Derna)
Fishery Assistant (Tobruk)
Accountant/ Storekeeper
Clerical Assistant
SECRETARIAT
Administrative Secretary
Accountant
Clerical Assistance
RESEARCH
Marine Biologist
Assistant Marine Biologist
Laboratory Assistant

Figure 3.4 Fishery administration
Source: Fishery Administration and planning (1964)

Table 3.8 show the financial statement of fisheries sector for the period 1963 -1968. However, budgetary provisions must be complemented with structural works to improve fisheries. According to the Asciak (1964) report, the five year development plan's (1963 -1968) ability to improve fish distribution relies on: 1) licensing fish – retailers; 2) enacting the draft law prepared by expert in collaboration with FAO Headquarters; 3) instituting a credit system as envisaged in the financial assistance scheme provided for in the draft law; 4) confirming the appointment of a director of fisheries and enhancing the proposed establishment of the fisheries administration; 5) constructing wholesale fish-markets in Tripoli and Benghazi; 6) creating fisheries stations in Tripoli and Benghazi; 7) providing harbour facilities for small fishing boats; 8) founding a campaign for greater local fish consumption and 9) developing the different sectors of the fisheries in the following manner:

a) Concentrating first on the development of the small inshore fisheries as an immediate objective;

b) Developing the pelagic fishery as an intermediate objective;

c) Continuing the fishermen's training in trawling to enable future development of the trawl fishery as a long-term objective.

d) Applying better conditions for the Tunny fishing concessions to induce greater investment by the operators of this fishery.

It is not noted in the reports that have been recorded after 1969 whether these plans have achieved their objectives or the coup led by Colonel Gaddafi in 1969 has led to dissolution or abolition of these plans. It was all a new beginning.

Table 3.8 Fisheries sector financial statement (LD) for the period 1963 -1968

Description of Project	1963-64	1964-65	1965-66	1966-67	1967-68	Total
Loans for fishermen	60.000	10.000	30.000	40.000	25.000	165.000
Grants to fishermen	--	--	10.000	10.000	5.000	25.000
Loans for ancillary services	---	---	--	10.000	10.000	20.000
building a fisheries station in Tripoli	---	25.000	--	--	--	25.000
Building a wholesale fish market in Tripoli	---	20.000	--	--	--	20.000
Building a fisheries station in Benghazi	--	25.000	--	--	--	25.000
Building a wholesale fish market in Benghazi	--	20.000	--	--	--	20.000
Providing harbour facilities for fishing boats	5000	5000	5000	5000	5000	25.000
Research/ training Vessel	15.000	15.000	15.000	15.000	15.000	10500
Building fisheries station in Benghazi						
Etiological and technological research						
Instituting a revolving fund for a fishing material supply Service	20000	--	--	--	--	20000
Total	100.000	120.000	90.000	80.000	60.000	450.000

Source: FAO (1964) Fishery administration and planning 1964

3.2 - Republican/the Jamahiriya Libya, from 1969-2011

Oil production has improved Libyan finances but resentments over the control of massive wealth in the hands of elite were increasing. This discontent led to the September 1st 1969 *'Al Fateh'* Revolution. The revolt was led by a small group of military officers headed by an army officer called Muammar Gaddafi; the revolution toppled King Idris regime. In the official government statements and the Libyan press, Gaddafi was referred to as the, *Brother Leader* and *Guide* of the revolution. The revolution proceeded to shut down foreign military bases, nationalise banks, take away the belongings of the Italian colonisers, and found the so-called Arab Socialist Party. The monarchy constitution and the parliament were dissolved (African Development Bank, 2014). Instead, Gaddafi advanced the *Third Universal Theory* (see section 2.2.2.1), as an alternative to both capitalist and communist ideologies (Mazar, 2012). Primarily, the channel of communication between government and civilians is through tribal representatives under the unconventional structure of the People's Committees. Nonetheless, in reality, the people could not exercise much influence since the current regime was rapidly moving towards political centralisation; in fact, it attempted to impede the development of operational public institutions, the guidelines of governance, creation of civil societies and real private economic activities. Since real civil society is absent, many Libyans were obliged to turn back to their previous tribal ties (and even their tribal laws) to run their everyday affairs.

The regime practiced a new policy of 'divide and rule' aimed at instigating regional conflicts in the already fragile provinces. The regions and tribes turn against each other in order to reduce the probable challenge to the central authority (African Development Bank, 2014). The formalisation process of Libyan politics under Gaddafi's *Jamahiriyya* could be considered the reason for the illnesses of Libya (Vandewalle, 2006). As the political system of Libya has shown in section 2.2.2.1, the Jamahiriya ruling system is characterised by being an extremely complex formal system that comprises a large number of congresses and committees, often with corresponding powers contributing to a sense of organised and long-lasting disorder (International Crisis Group, 2011). This 'organised chaos' seems to be the envisioned as the product of Gaddafi's resolve to stress complete individual control, while thwarting the appearance of any individual or group able to challenge his rule. Table 2.3 and section 2.2.2.1 show centres of influence in political decision-making in the era of Gaddafi. In short, Gaddafi intentionally created a mess system, where injustice, lack of freedom (political, economic and social) and tribalism, in order to control the state. To succeed, Gaddafi established dictatorial regime in an undemocratic setting and acquired the power to own and control the entire oil wealth of the country. This action is considered by Di John (2011) and Vandawella (1998) as one of the most important features of a rentier state.

➢ Development Plans Since 1969 (Gaddafi's Era)

This section presents a synopsis of the development plans after the 1969 revolution with focus on state policy towards agriculture. Discussion in this section is concerned with whether these national plans have promoted a diversified economy, or not. Examples are drawn from different sectors but more importantly focuses on agriculture and fishery. It is worth mentioning here that all economic plans drawn up by Libyan government were associated with conditions of oil revenues, which in turn are linked to global oil markets demand (Al-Rubaie, 2004). The primary accomplishments of the revolutionary government were its management of the oil sector and the dramatic change in the oil exporting policy in 1970s. That was properly timed since the revenues continued to increase in spite of the decrease in production by 40% from 1970 to 1972 (Allan, 1981). Although the first few years witnessed a perpetuation of the preceding economic policies and the private sector thrived dramatically, it was evident that big changes were to be initiated soon after the first statement was delivered. The new government entrenched socialism and attempted to enhance self-reliance and self-sufficiency, particularly in food production. According to Ghanem (1987), socialism in Libya was interpreted as extending the public sector and decreasing private enterprise. Consequently, Libya's revenue from oil production and export increased and the regime's planning continued, but this time with strategies for concurrently developing diverse sectors (Ghanem, 1987).

➢ Economic Development Objectives

All development plans were focused on economic diversification. According to Edwik (2007:96), the following 14 points have been repeatedly stressed as the objectives for development:

1) Diversify the economy and reduce dependency on oil.
2) Reduce marked disparities in the prosperity and growth of different areas and regions in the country.
3) Maintain a high level of employment.
4) Raise per capita income through an increase of productivity.
5) Maintain a relatively stable price level.
6) Encourage and foster good industrial labour relations to achieve increased efficiency and higher productivity.

7) Achieve a more equitable income distribution.
8) Develop an adequate and comprehensive national system of education.
9) Develop a comprehensive system of national health services to provide facilities adequate to raise, the levels of all aspects of public health.
10) Provide adequate public services through: (a) improved communication; (b) Adequate water, sewage, and sanitation facilities to all areas of the country; (c) Drainage and irrigation facilities for agriculture development;
11) Increase the economic development rate.
12) Provide adequate power facilities.
13) Encourage and promote private sector participation in all aspects of national development projects.
14) Increase and improve the standard of living and advance the quality of education.

➢ Development Plans (1970-1985)

It could be argued also that this phase had primarily focused on infrastructure and social services. For example, to achieve compulsory education, compulsory education to all school age population, improve the structure and level of health services, and the development of housing situation (Alchukhuchi, 2003). Since this development plan, the developments achieved have so far surpassed what other undemocratic and oil-rich countries like Nigeria and Angola have been able to achieve. Literacy rate is about 86% and life expectancy has risen from 61 to 75.3 years compared to Nigeria (52.5), Angola (51.9) and Algeria (71). The overall Human Development Index (HDI) 2014 has placed Libya ahead of these countries (UNDP-HDI, 2014). This is because Gaddafi was able to provide free public health care service and education and used it as a tool for propaganda and show of sovereign supremacy. According to Yvonne de Vito, a reporter for Russia Today, "Libya is considered to be the Switzerland of the African continent and is very rich and schools are free for the people. Hospitals are free for the people" (Russia Today, 2011:1). The quality of infrastructure and services delivery relative to other countries standard remains a subject of contest which I do not intend to dwell into (Russia Today, 2011).

After the 1969 revolution led by Gaddafi, agriculture expenditures topped spending list and self-sufficiency was realised since it became one of the topmost need of the Libyan people and government. A number of policies were made and substantial amount of money was spent to attain food security in the 1970s and 1980s via developing irrigated agriculture which was based on indigenous aquifers (Otman and Karlberg, 2007). An investment incentive plan was implemented; its aim was to create a diversified economy and unleash the potentials and develop the diverse sectors covering agriculture, industry, transportation, communications, housing and electricity. Therefore, agriculture received considerable attention within the economic and social transformation strategies carried forward from the 1970s. Furthermore, appropriate and convenient forms of support were provided for the services sectors (Edwik, 2007). The economy was liberalised to allow private participation in the food-supply chain as government realised it lacks the manpower capacity to deliver. The ultimate objective was to boost agricultural production so that the country can attain food security and self-sufficiency with respect to essential goods and food products (Elmessallati, 2007; Edwik, 2007; Otman and Karlberg, 2007). This objective was integrated with the development of industries for finished goods to promote production in the non-oil sectors and enhance their contribution to GDP. The non-oil sectors increased its contribution to revenue, owing to encouraging investment made predominantly in agriculture, small-and medium-sized and heavy factories, for the processing and production of wood, paper, textiles, foodstuffs, pharmaceuticals, iron and steel and petrochemicals.

Achieving self-sufficiency is one of the political slogans of economic independence made by the 1969 coup plotters. As a result, policies drawn and actions taken were to achieve sufficiency in food, grain specifically. One of the basic ideas stated in the Green Book was that, political and economic independence cannot be achieved if the dependence was mainly on imported food. The slogan was that there is no freedom for the people eating from beyond the sea; Green Book, part three (Mazar, 2012). Three development plans were identified in the 1970s. According to El-Wifati (1987), for the first phase: (1970-1973), (1973 -1975), the actual spending of the budget size during the transition period (1970- 1972) amounted to about LYD791 million, while the actual spending for the agricultural sector amounted to about LYD135 million or 17% of total investments (General Planning Council, 2000). These spending could be viewed as numerical targets for the production and distribution of grains depending on irrigation and rain-fed system, including ranges between eight per cent of the arable land in Libya. Grain (such as wheat and barley) production occupied an important position in the grain self-sufficiency strategy, since it represents the main source of subsistence - for example, bread is essential for people's livelihood. However, production fluctuated over the past decades due to limited water availability (irrigation and rainfall), mismanagement and inadequate policies (Mazar, 2012). Self-sufficiency deteriorated between 1962 and 1977. By 1962 around 66% of the food was obtained from local agricultural output, but in 1977, the local agricultural output obtained was only 28% and food imports reached 72%. The increase in income and the rapid growth in population have led to an increase in the demand for food. Also, agricultural production could not meet increasing demand for food because of limited availability of water for irrigation of grain crops (Mazar, 2012).

The fisheries sector in the development plans of 1973-75 and 1976-1980 were aimed at:

1- Increasing self-reliance concerning food production and high calorie diet intake;
2- Enhancing the sector's contribution to GDP;
3- Expanding the production base in the field of aquaculture;
4- Contributing to the provision of foreign exchange by increasing exports and reducing imports of fish.
5- Enlarging the production base in the field of aquaculture.

In the Development Plan of 1973-75, marine resources fall under agriculture and forestry, where both were allocated LYD 555 million. Out of these, only LYD 6.7 million, representing 1.2% of the total of allocation to all sectors, was allocated to the marine. In the aquaculture plan (1976-1980), the fishing sector allocation amounted to LYD38.35 million: only 5.5% of the total allocation to agriculture (General Planning Council, 2003). As a result of increasing allocation and attention given to fisheries, the sector reacted positively. Three companies indicated interest and began to exploit the Libyan waters with modern trawlers at the time. As a result of this large-scale fishing, Allan (2014) noted that total catches rose from less than 1000 to 4000 tonnes per/year. Production rose from 1957 tonnes in 1972 to an excess of 4500 tonnes in 1979 (National Foundation for Maritime Investment, 2005, Alan 2014). Breakthrough in production was achieved in 1974 (4019 tonnes), 1975 (4803 tonnes), 1976 (4005 tonnes) and 1978 (4355 tonnes) (National Foundation for Maritime Investment, 2005). The three year plan of 1973-1975 contributed to the boost in production because some factor conditions, such as fishing ports (e.g. Al Khums, Tripoli and Zanaur) and refrigeration facilities (e.g. Surt, Tubruq, Darnah and Susah) were improved and constructed respectively. For the processing of fish, sardine canning factories at

Zuwarah and Al Khums, with a combine production level of 1000 tonnes per annum were constructed (Alan,2014). The drive for massive investment in fisheries was based upon a number of commissioned reports on the potential of the sector (Alan, 1982). However, these reports have not considered the competitiveness of fisheries under 1) Libya as a fully developed oil-based economy, and 2) post-oil era. Because all these factors are considered under Porter's competitiveness theory makes this thesis a distinctive comprehensive analysis of Libyan fisheries development. Meanwhile, Table 3.9 outline achievements of the 1973-75 Plan.

Table 3.9: Achievements in fisheries under the 1973-75 Plan

Libyan fish catch	1973	1975
Libyan fish catch	2809 tonnes	4803 tonnes
Imported fish	4305 tonnes	4000 tonnes
Total consumption	6797 tonnes	8800 tonnes
Per capita consumption	3 kg	3.5 kg
Fishermen		
Libyan	300	500
Non-Libyan	200	300
Total Fishermen	500	800

Source: Alan (2014) Libya since Independence: Economic and Political

3.3 Socialist Transformation in the Second Phase (1976-1980)

The government decided to change the economic system into the socialist transformation agenda in 1978 and was manifested in state plans (1976-1980 and 1981-1985). This made the public sector dominate all economic areas and diminished the role of the private sector to the greatest extent (Bsekray, 2006). According to Ghanem (1987), the 1969 Libyan revolution was accompanied by radical changes in the system of Libyan state which became state-socialism with a nationalisation programme at the core of the new political order. The new regime advocated the expansion of public sector owner-operator model while shrinking the private sector, and called for public sector led self-reliance and self-sufficiency in food. As agricultural production remained abysmally low, Libya became a net-importer of food, importing about 80% for its increasing population (FAO, 2011). It can be argued that Libya may not have achieved food self-sufficiency due to its over-reliance on oil revenue to subsidise food imports.

The first five-year plan (1976- 1980) was an extension of the Tripartite Plan (1973-1975) in the framework of a long-term program where the plan was a strategy to achieve long-term economic goals. The plan also included strategies to: achieve self-sufficiency in most agricultural crops, protect natural resources and ensure efficient exploitation as possible, raise farmers' incomes by increasing the productivity of agricultural land, establish agricultural units in areas characterised by an abundance of production and create clusters in new agricultural areas (Elmessallati, 2007). The plan anticipated increase in GDP and additional jobs opportunities (The Ministry of Planning, 1976). Allafi (2013) also added that the plan aimed to link agricultural production with industry, to achieve balanced development, and to work on the manufacture of agricultural products to replace imports. Allafi (2013) identified how the following objectives were set to achieve government's goals in agriculture: 1) human resource training and development, 2) technical skills acquisition for utilising vertical and horizontal linkages in agricultural production, and 3) private sector encouragement in providing training and agriculture education. Amidst the successes recorded, many man-made and natural difficulties were encountered, such as shortage of water, low technical skills and poor extension services, weak institutions, poor financing, processing and marketing Allafi (2013).

Libya has a centrally planned economy and the essential feature has been direct intervention from the government in all economic activities (Joffè, 2011). Between 1976 and 1980, the average share of public sector investment allocations to agriculture approximately 93.1% versus 6.9% from the private sector. Similarly, the share of public sector investment volume for the industrial sector was about 97.7% versus 2.3% from the private sector. This period has seen a steady rise in economic growth rates, mainly due to increasing proportion of oil sector composition of GDP. However, it led to the move of comparative advantages towards this sector and away from basic commodity (agriculture and manufacturing) activities (Al-Rubaie, 2004). For example, the average contribution of agriculture and manufacturing sectors in GDP were 9.5% and 5.8% respectively in 1962, but it did not exceed 4.9% and 3.4% from 1970-1980 (Al-Rubaie, 2004). In subsequent years, the domination of oil continues to erode the objectives of developing non-finite sectors for diversification, employment and the realisation of food self-sufficiency. Meanwhile, the various Secretariat of Marine Wealth (SMW) reports has persistently called for 1) improvement on the sector's performance since it is a vital source of food security, employment opportunities and earnings, and 2) exploitation of marine resources via means that comply with the requirement for sustainable development and sustainable future of Libyans (the General People's Committee for Marine-wealth, 2000). In the five year plan of 1976-80, some projects were taken further and improvements were made in the design and capacity of harbour. The port of Zuwarah is one of these projects. In addition to the three companies operating large-scale fishing, new joint companies were also licence to fish in deep waters. More money was made available to overcome the difficulties limiting growth of the sector (see table 3.10).

Table 3.10 Budget Allocations for fisheries 1976-80

Harbours, lighthouse, etc	LYD 20,000,000.00
Expansion of companies	LYD 5,000,000.00
Cooling and refrigeration plants	LYD 10,851,000.00
Research and training	LYD 2,500,000.00
Total	LYD 38,351,000.00

Source: Allan (2014)

❖ The Third Plan (1981-1985)

This plan comprised the basic strategies aimed at achieving self-sufficiency in most agricultural crops. Farmers' incomes were raised by increasing the productivity of the agricultural land, and new agricultural areas were created. The General People's Committee for Planning (1999) included the transition plan (1981-1985) as a set of policies and programs that complements policies from the previous plan. Some of the following agricultural policies were introduced: the development of Coastal Strip Policy and Investment in Water Resources Policy (Elmessallati, 2007). There was a turn of events after the collapse of oil prices and lower production in the 1980s where Libyan state found itself facing severe economic crisis (Bsekray, 2006). To reduce the budget deficit funded by the state and to reduce excessive burden, government came up with a quasi-privatisation policy, but still maintained socialist principles and controlled the burden of development, and financing all sectors and industries. As a result of these changes, budgetary allocation and government investment in agriculture rose to an all-time high of 93% compared with 6.9% from the private sector (AL-Chukhucka, 2003). Government intervened directly in the economic life of the citizens after the socialist transformation initiative of 1978. The state entered the all sector and dominated them -

private sector role was reduced and marginalised. There was about 80% of public sector employment (European Commission, 2013), which have resulted in bloated wage bill, and with the uprising of 2011; public sector employees suffer salary reductions.

A review of five-year economic development plan (1976-1980, 1981-1985) indicate that around 85% financial allocations was made for implementation. The private sector became inexistent because Libyan socialism included the nationalisation of banks and foreign institutions, as well as industrial and construction companies. The oil boom helped in the breadth of public sector activity and has provided for the Libyan state surplus finance to fund large-scale projects without an extensive study of their economic feasibility (Bsekray, 2006). Ghanem (1985) cited in Abubrig (2012:131) states that: "the value of projects signed in Libya as part of the five year plan which was started before the sudden fall in oil resources was US$1.827 billion in 1981, the value of projects signed in 1982 went to US$1.374 billion". Table 3.11 shows spending allocations from 1970 to 1985.

Table 3.11 Spending allocations from 1970-1985 (Million LYD)

Year	Agriculture	Services	Education	Health	Manufacturing	Construction
1970	23.4	114.8	17.1	9.8	21.8	32.8
1971	47.8	95.2	27.6	17.0	32.1	39.9
1972	63.8	193.4	39.9	24.1	68.1	72.9
1973	88.9	229.6	47.8	16.7	79.7	76.9
1974	223.9	389.5	62.9	22.9	110.9	148.2
1975	242.2	482.8	110.0	26.6	129.7	142.7
1976	338.4	560.1	112.0	35.8	199.4	150.5
1977	303.9	676.8	120.0	47.1	194.0	185.5
1978	373.4	790.1	122.0	68.1	225.3	231
1979	352.1	676.2	98.7	69.1	203.4	166
1980	448.1	1016.4	145	93.0	614.9	231.7
1981	462.22	1158.7	202.7	106.1	727.1	288.2
1982	351.8	1248.7	209.2	92.7	475.9	245.6
1983	30.9	1142.3	161.4	75.8	494.9	217.6
1984	306.4	1042.2	138.6	71.3	415.4	208.2
1985	239.9	833.1	117.4	55.2	254.2	168.6

Source: General Council of Planning (2001).

The government was accused of inflating spending on the agricultural sector (El-Wifati, 1987). In addition, the revolutionary government repeated the mistakes of the 1960s by increasing investment in agriculture without accounting and monitoring spending. According to Allan (1981), agriculture, industry and the infrastructure all suffered to a varying extent (after 1972/83) from the pressures of absorbing and non-absorbable level of investment. According to Elmessallati (2007), problems and difficulties faced in the agriculture sector include: rainfall fluctuation, low level productivity, lack of sufficient expertise and technical staff to manage and follow-up projects, lack of detailed studies on the natural resources and rational use, and short-term period of the plan. Agriculture was not viewed as a tool for rural development nor was it recognised as a business. The value-chain ranging from production, processing, transportation and marketing were areas not focused upon. As a result of these factors, contribution to GDP made by this sector did not respond to budgetary spending (Shalluf et al., 2010). The lack of sufficient number of skilled Libyans in the labour force remained a problem in the 1970's. Despite large resources spent on training Libyans, government still relied on foreign workers (Allan, 1981). Table 3.5 shows that, at the end of 1979, the oil sector's contribution to the GDP was significant, amounting to LYD 94250 million, but soon declined, reaching its lowest in 1984 - when it was estimated at LYD 46882 million - due to the recession in oil markets. This reflected positively on the percentage contribution of agriculture, forestry and fishing and manufacturing sectors, where the highest rate was estimated at 1.9 % and 2.0% in 1981 and 1985 respectively.

Table 3.5 Gross Domestic Product for some sector (1970 -1985) (LYD Million), 2010 price

Year	Agriculture, Forests and fishing	Oil Sector	Manufacturing	Total GDP	Agriculture, Forests and fishing %	Manufacturing %	Oil Sector %
1970	204	111925	66	114280	0.18	0.1	98
1971	238	91635	69	94931	0.25	0.1	96.5
1972	333	32818	96	37202	0.9	0.26	88
1973	480	42258	137	48033	1.0	0.3	88
1974	489	84423	166	91734	0.5	0.2	92
1975	593	65511	184	73984	0.8	0.25	88.5
1976	677	85384	246	95048	0.7	0.26	89.8
1977	566	90746	340	101575	0.5	0.3	89
1978	614	78525	395	99452	0.6	0.4	79
1979	652	94250	381	107373	0.6	0.4	88
1980	1075	81062	433	97274	1.1	0.4	83
1981	1228	49152	506	65805	1.9	0.8	75
1982	1254	52351	528	70336	1.8	0.8	74
1983	1321	48818	674	66489	2.0	1.0	73
1984	1333	46882	736	64123	2.0	1.15	73
1985	1343	54547	888	69649	2.0	1.3	78

Source: Further modified by the researcher from Mazar (2012)

The marine resource development program in the Economic and Social Transformation Plan 1981-1985 was based on a range of themes; these are:

1- Exterminating the old sector structure in order to apply the slogan "partners rather than employees" to transfer the production units that are publicly owned to Corporatism 'Charkiyat' owned by the employees; the public sector companies should grant the employees and other small investors shares to become collective joint-stock companies.

2 Organising and rationalising the exploitation of marine resources and wealth to prevent tampering with or exposure to draining and to develop the required techniques.

3- Reliance on self-financing to carry bulk of the burden of comprehensive plan of the sector as well as funding that must be supplied by state resources.

AL-Arbah (1996) observed that the government advanced this important sector and promoted investment in fisheries by creating maritime fishing ports, refrigerators and ice plants, and establishing public companies for fishing, as well as cooperative societies for marketing. It tried to support fishermen who are actual fishermen and who are reluctant to proceed with it due to the difficulties they encountered. Prioritising food security and self-sufficiency by the General People's Committee for marine wealth complies with what the Green Book's: "no independence for a nation that eats from outside its borders" (Muammar Al- Gadhafi, 1973). Table 3.12 below show the economic development allocations 1973-1985.

Table 3.12 Economic development allocations 73-1985

Development plans	Allocations for each plan L.D	Annual allocation for each plan L.D
Three-year plan	8.920.000	2.973.333
Five -year plan	38.351.000	7.670.002
Five -year plan	97.000.000	19.400.000

Source: Al-Arifi, M. (2008) fish Production in the East of Libyan Coast: Geographical Potential and Barriers.

Libya's determination to develop a modern fishing industry is further illustrated in the budget allocations for the period 1981-85 (see table 3.13).

❖ The Planning Covering 1986-2000

This period (1986-2000) has seen a number of economic and political events that have dramatically affected economic development plans. The most significant among them were the fall in world oil prices in mid-1980s where prices collapsed (West Texas Research Group WTRG 2010) and imposition of United Nations Sanctions in 1992-2003 (Security Council Report, 2013). In his book, *Libya since independence, oil and state-building,* Vandewalle (2006) enumerated significant events that impacted on the Libyan economy:

- By the end of 1985, Libya dismissed numerous foreign workers in an attempt to balance the country's budget as a result of a drop in oil revenues.
- In January 1986, United States stopped importation of goods and services of Libyan origin. Moreover, United States companies were forbidden from being engaged in industrial or commercial activities with Libyans.
- In the mid-1980, the economic situation in Libya started to worsen owing to the downfall in oil price to around US$8 for a barrel (WTRG, 2010).
- In April 1992, commercial embargo on air flights to the Jamahiriya was endorsed by the United Nations Security Council.
- In August 1996, the United States adopted a new legislation that involved reprisal against foreign companies that did business with Libya.

These events exhausted the Libyan government economy and made it unable to finance planned development projects and programs. The Libyan government tried to get rid of the financial burden when it started to transfer the economy into private entities. In 1987, open criticism to the country's economic adversities was directed at the General People's Congress meeting. It was followed by a gradual economic liberalisation of commercial services, construction and industrialisation so as to improve the performance of public enterprises. On May 1987, Gadhafi delivered a speech on industries and agriculture reform, where he announced the so-called Libya's *Infitah* policy – meaning, economic liberalisation (Vandewalle, 2006). The Libyan approach to socialism was clarified during the second half of the decade with the publication of the second part of *The Green Book, entitled, The Solution of the Economic Problem: Socialism*, in 1978 (Bruce, 2008). However, Mazar (2012) believe that just before the UN Sanction that lasted for 12 years and after the oil shocks, positive developments have being recorded in Libyan economy. For example, from 1986 to 1992, the levels of non-oil GDP have grown slightly. During these times, the objectives of the development plans in agriculture included the following (Elmessallati, 2007):

1. Liquidating the remaining commitments to the transformation projects of the previous plans.
2. Completing ongoing projects and the expected ones.
3. Maintaining the various projects, including the work assets in order to enhance their efficiency and prolong their durability.
4. Exploiting the new investments to develop technical and human potential in the different regions, taking into account spatial balance in development.
5. Encouraging savings and enhancing commercial banks' role in the economy.
6. Encouraging investors to invest in the private and individual sector.
7. Maximise the efficiency of the investments that were implemented.

Agricultural development programs from 1985 to 2003 were drawn but not implemented Perhaps, attempts were made to prepare plans during the period that followed but these plans were neither executed (Elmessallati, 2007). For the fisheries sector, the Secretariat of Marine Wealth (SMW), tasked with developing the fishing industry, was inaugurated in 1988 to manage and co-ordinate 24 marine fishery cooperatives called *Jamaia*. Although SMW was dissolved in year 2000 and decentralised to regional authorities (*Sha'abiyat*), it was able to establish fishing centres that served artisanal and low-scale fisheries (Otman and Karlberg 2007). Whether any of these fishing centres remains or have made any impact can be seen in chapter seven. Table 3.13 shows marine resources annual budget (1988 to 1993) which were approved to focus more on:

- ➢ Establishing 16 ports and harbours along the Libyan coast whilst improving conservation and refrigeration of fish to meet the needs of the sector and to increase the number of *Jarafats* and boats used for coastal fishing.
- ➢ Renovating plants, establishing 10 fish farms, training staff and drawing rehabilitation programs as well as founding training centres.
- ➢ Supporting the cooperative societies and providing them with assistance, facilities, loans, and equipment; 250.000 Dinars Libyan have been allocated to associations in the form of free equipment.

Table 3.13 Annual plans budgets (1988 to 1993)

Year	Allocations	Actual spending	% of Actual spending
1988	12.000.000	1.700.000	14
89-1990	13.750.000	9.680.000	70
90-1991	12.000.000	10.750.000	89.6
91-1992	12.000.000	9.000.000	75
92-1993	10.000.000	1.000.000	10
Total	59.750.000	32.130.000	53.8

Source: Al-Arifi, M. (2008) fish Production in the East of Libyan Coast: Geographical Potential and Barriers.

It is disappointing to note that none of the above objectives was accomplished due to the numerous difficulties encountered during the transformation period 1986-1990. The main problem with all the national development plans is that they all lack brevity and coherence; they do not suggest how, or at what pace, these objectives can be met even when financial provision were made (Edwik, 2007).

Agriculture, which had previously supported a large proportion of the population, started to suffer serious problems. As it was in the 1970s, agricultural labour force migrated to the urban areas for employment in services and construction sectors, leading to a decline in agriculture production. As a consequence of shortage in agricultural production, Libya's government mentality was to always fall back to oil revenues to purchase food. What remains of the oil import revenue was spent on capital goods and everyday essential commodities (First, 1980).

- **Economic Development in 2000s**

The lifting of international sanctions on Libya from 1999 to 2002 coupled with rising oil prices marked the beginning of national economic recovery management. From the beginning of 2001, various policies, procedures and institutional changes aimed at reducing the restrictions and opening up the economy were adopted. The New Partnership for Africa's Development (NEPAD) and Food and Agriculture Organization of the United Nations (2006) state that since 2003 Libyan socialist ideology slightly changed to a more relaxed form of global capitalism with the emergence of a new development paradigm and reforms that opened up the economy. This was followed by the ratification of the economic and social transformation plans drawn by the General Planning Council in 2006 (Mazar 2012). This period was characterised by changing the economic system with a bigger role for the private sector (Abuarosha, 2013). According to Mazar, (2012) the most important objectives of the economic programs approved for this period are the following:

1. Working on removing the parallel market through gradual liberalisation of exchange.
2. Working on increasing investments in the development budget.
3. Reducing the budget deficit and eventually eliminating it gradually; working on the domestic debt liquidation.
4. Achieving a level of economic growth that leads to a sustained improvement in living standards.
5. Increasing the exploitation of the idle production capacity in the non-oil sector, especially in the industrial sector.
6. Directing oil revenues towards productive investments.
7. Encouraging the private sector and strengthening its role in the economic activity and development.

In 2003, Libyan leadership called for public sector transformation into what is called the people's capitalism. Privatisation was the big shift when the state decided to privatise more than 360 companies belonging to the public sector (Porter and Yergin, 2006). As a consequence, the Libyan economy began to witness post-sanction local and foreign investments, particularly in the services and construction sectors. Consequently, the government suspended the adoption of development plans and completion of previous projects was done arbitrarily and not according to planned budgets. As a result, public sector spending on food supply and agriculture, construction - roads, mass housing, water projects – and services faced severe cut. (Mazar, 2012).

Whilst the economic system moved towards a market system after 1999, the regime continued its political ideology of glorifying the state, including the Socialist propaganda. Double standard policy still continues by maintaining the old and the new system until the fall of the regime. This led to clashes and conflicts resulting in a delay in the application of the laws of privatisation and open markets (*ibid*). Thus, in spite of the government encouraging remarks for the private sector and the rise of some sort of privatisation in certain public sector entities, the private sector remained alert: it averts large production investments that could enhance domestic supply owing to the risks involved or to mistrust in government purposes (Mazar, 2012). This was due to the lack of private sector confidence in the sustainability and credibility of the change in the economic trends (as a result of long years of volatility in the policies adopted) that impacted negatively on sectoral performance. Mazar, (2012) state that the problems of the manufacturing industry have worsened the privatisation program as a whole because it was not successful in transferring the ownership of many facilities from the public to the private sector. Thus, the non-oil productive sector stagnated or grew at low rates modestly reducing its role in the economy whereas oil production is active and steadily rising until the outbreak of the 2011 Arab Spring in Libya. As indicated by figure 3.6, oil production and GDP have grown steadily after international sanctions on Libya; but the sharp decline in oil production due to the 2011 crisis has led to corresponding collapse of the GDP. This is because oil is the driver of the rest of Libya's economy.

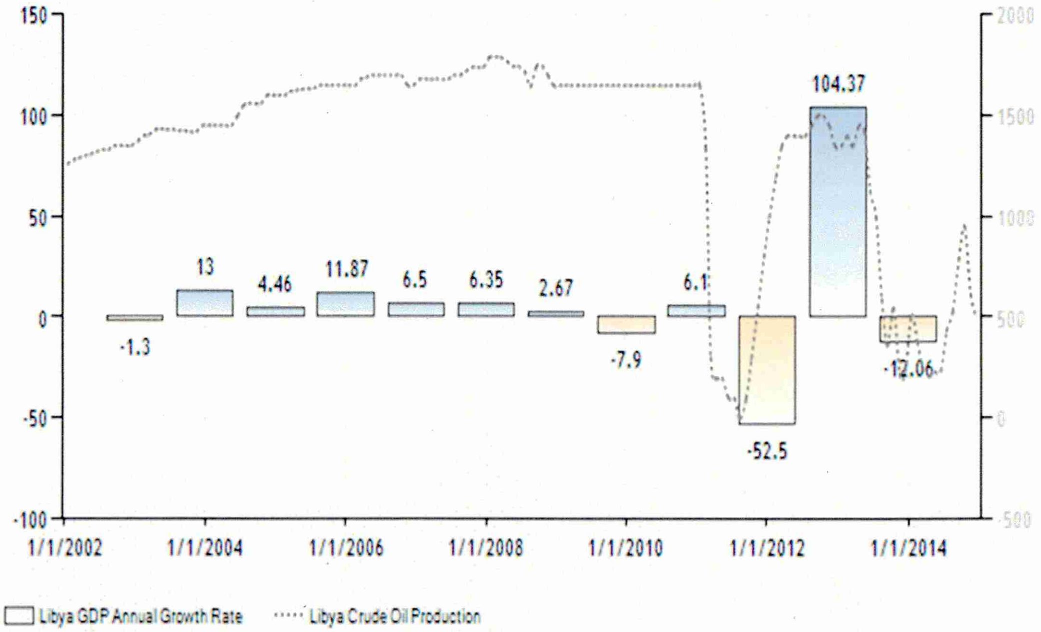


Figure 3.6: GDP growth and oil production.
Source: Trading Economics (2015)

Libya has followed a policy that is directed towards realising food self-sufficiency, increasing national fleet and providing employment opportunities to citizens in the fishery sector AL-Arbah (1996). Nonetheless, the absence of long-term fisheries supervision and development policy resulted in a chaotic situation which was detrimental to the use of marine resources, besides the inability to assimilate fisheries into national economic plan with respect to providing employment opportunities (FAO, 2008). Table 3.14 presents sector contribution to the economy. The table shows the percentage contribution of the agriculture, forestry and fishing to the GDP, where the highest rate was estimated at 11% in 1998 whereas for the manufacturing sector, the highest rate was 5.4% in 1986. There was an increase in the contribution of agriculture and manufacturing: 9.2 in 1997. These sectors achieved growth rates due to the decline in the contribution of oil, probably because of the embargo and lowering price. However, when the oil sector rebounded again during the period of 2002-2010, the level of contribution of both agriculture and manufacturing was at this point at its lowest; in fact, it was worse than it was at the onset of the petro-dollar.

Table 3.14 GDP Oil, Agriculture, fishing and forestry, Manufacturing, Services and Construction for some sectors, 1986 -2010 (Million LYD)

	Oil GDP	Agriculture, fishing and forestry	Manufacturing	Services	Construction	TGDP	% (A)	% (M)
1986	2596	385	360	1063	493	6961	**5.5**	**5.2**
1987	1875	411	335	868	411	6012	**6.8**	**6.8**
1988	1570	423	397	1204	384	6186	**6.8**	**6.8**
1989	2056	440	412	1421	451	7191	**6.12**	**6.2**
1990	3244	483	458	1148	458	8247	**5.8**	**5.8**
1991	3104	542	476	1654	340	8757	**6.2**	**6.2**
1992	2926	630	555	1897	459	9232	**6.8**	**6.8**
1993	2460	709	700	1684	513	9138	**7.76**	**7.7**
1994	2893	828	604	1741	493	9671	**8.6**	**6.2**
1995	3380	933	743	1730	478	10672	**8.7**	**7.0**
1996	3960	1075	703	2021	672	12327	**8.7**	**5.7**
1997	4506	1267	819	2304	703	13800	**9.2**	**9.2**
1998	2786	1394	779	2542	713	12611	**11.0**	**6.2**
1999	3996	1450	863	2429	804	14075	**10.3**	**6.1**
2000	7081	1438	890	2666	1014	17776	**8.1**	**4.8**
2001	6327	1392	878	2901	1063	17621	**7.9**	**5.0**
2002	12299	1349	813	2859	1342	24220	**5.6**	**3.3**
2003	18037	1376	765	3406	1249	30627	**4.5**	**2.5**
2004	26692	1439	761	4286	1425	40951	**3.5**	**1.8**
2005	39491	1554	799	4682	1788	55670	**2.8**	**1.4**
2006	49651	1604	817	5174	2055	67407	**2.4**	**1.2**
2007	54847	1685	893	7040	3690	77732	**2.2**	**1.4**
2008	70993	1958	1064	8791	4853	99376	**2.0**	**1.07**
2009	41417	2077	1156	8967	4978	71513	**2.9**	**1.6**
2010	57197	2278	1257	9146	5029	89223	**2.5**	**1.4**

Source: Mazar (2012)

In general, the flow of oil revenue clearly had a negative impact on agriculture and manufacturing industries. This proves that the availability of funds and expenditure alone, without follow-up and implementation of high quality projects, is not enough to bring about positive economic results. This clearly manifested when the contribution of agriculture, forestry and fisheries to the GDP became weak because the state failed to make these sectors effectively productive.

- **The Development Plan of 2006-2010**

National Foundation for Maritime Investment (2005) the objectives of fisheries as contained in the above development plan were:

1. Encourage the creation of an investment climate in the field of marine resources to attract foreign investors in order to benefit from the transfer of technology, especially in the field of aquaculture.
2. Exploit the natural ingredients and make available resources to ensure that this activity contributes to the achievement of greater objectives.
3. Provide infrastructure.
4. Increase the contribution of the activity to the GDP.
5. Enhance fish production to achieve food security for the citizens and to increase its share of the fish.
6. Promote the volume of exports.
7. Increase support activity to finance the public treasury.
8. Develop coastal areas which would contribute to the creation of equal economic opportunities for the residents of those areas, an exploration of spatial balanced development.
9. Develop specialised national cadres for this activity.
10. Support the creation of value-added production, and creating jobs in:
    a. Boating industry and the provision of fishing accessories
    b. Residence and conservation units, refrigeration and ice plants.
    c. Establishing fish processing and canning factories
    d. Founding fish farms.
11. Activate the role of the private, domestic and foreign sectors in establishing and managing projects.
12. Strengthen and activate institutional and administrative structures and legislation governing the activity and laws.
13. Provide statistics and an information base and ensure the flow of goods.
14. Provide marketing services in all areas.
15. Raise the efficiency of existing projects.

16. Promote modernisation and technical development rates applied in the performance of the sector's activity.
17. Rehabilitate and train national workers.

Most or all of the above objectives are covered in this study. Chapters eight, nine and ten demonstrate whether or not these objectives have been achieved and what are the reasons for failure to achieve them.

- **Development Program (2008-2012)**

According to Mazar (2012), this program includes housing, utilities and transport (electricity, water, health, education and service buildings). The proposed budget for the project was about US$200 billion. Concerning the management development program, the work proceeded in two inseparable lines: the first line represents the establishment of the Council of Ministers in early 2010 which oversees the implementing agencies of the projects; whereas the second line represents the body of sophisticated management, monitoring and evaluation team. Table 3.15 show allocations and actual spending for the development projects and programs (2002-2011).

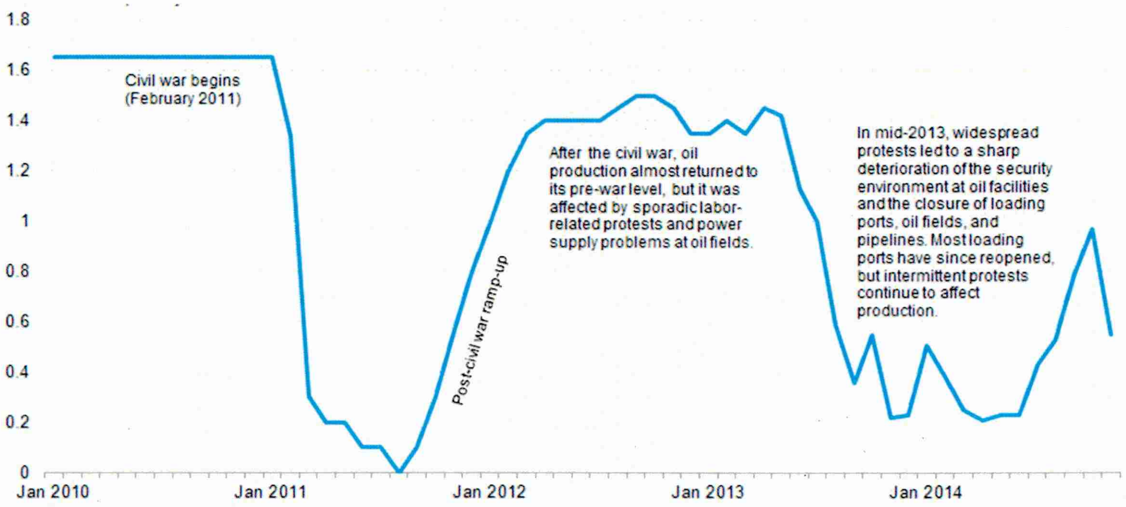
Table 3.15 Development programs allocations and actual spending 2002-2011 LYD m

Development plans		**Allocations**			
		Projects and programs	**Mortgage lending**	**Total**	**Actual spending**
Tripartite budget	**2008**	32452	1500	33925	28903
	2009	20550	1800	22350	18984
	2010	35398	1730	37128	23729
	2011	33304	1745	35049	
	2012	32401	1745	34146	

Source: Mazar (2012)

From 2008 to 2012, Libya's annual budget was only general, without specific emphasis on developing certain key sectors of the economy, as was pronounced in the first to the third development plans. However, huge investment continued with increase in income (pre-2008 economic crisis and civil unrest) and the partial liberalisation of the economy. Government's priority areas for infrastructure spending include social housing, transport, electricity, water, gas, health and education. A lack of existing institutions for ensuring effective coordination and monitoring of the implementation of government policies marred the realisation of these projects (Mazar, 2012). It is worthy of note that at the onset of the 2008 global recession, oil price reached over US$140 before diving to less than US$50 (Nissanke, 2009).

Figure 3.7 below provides a snapshot on the events in the oil industry just before, during and after the crisis but with continued hostilities. Libya's oil production prior to 2011 has been increasing from 1.4-1.75 million bpd in 2000 and 2008 respectively. The production rate of 1.65 million bpd in 2011, to less than 500,000 bpd in 2014 falls far below the peak production levels of three million bpd achieved in the 1960s. According to the Energy Information Administration (EIA) (2015) and as indicated in this chapter, Libya's oil production had been affected by nationalisation, sanctions, uprising and now going through post-2011 sporadic conflict that has not only crippled the oil sector but also the general well-being of Libyans.



Civil war begins (February 2011)

After the civil war, oil production almost returned to its pre-war level, but it was affected by sporadic labor-related protests and power supply problems at oil fields.

In mid-2013, widespread protests led to a sharp deterioration of the security environment at oil facilities and the closure of loading ports, oil fields, and pipelines. Most loading ports have since reopened, but intermittent protests continue to affect production.

Figure 3.7: Oil production and Libyan crisis.
Source: US Energy Information Administration Short Term Energy Outlook, 2014.

3.4 For the Future: Diversification is the Option

Since the discovery oil, diversification is not new to Libya as shown in the three development plans above, but is totally oblivious when it comes to implementation. What Kuznets et al. (1966) and Rostow et al. (1960) considered the structural transformation for growth and development is lacking. Structural transformation is defined as "the reallocation of economic activity across three broad sectors (agriculture, manufacturing, and services) that accompanies the process of modern economic growth", (Herrendorf et al, 2013:5).

Gelb (2010) indicated that the need to adopt economic diversification policy has many justifications for developing countries rich in primary resources. Firstly, diversification aims to secure the economy from the shocks enumerated throughout previous sections. Secondly, engagement in manufacturing allows the possibility of a dynamic learning and self-discovery, and also the ability of a single sector to open the way to other sectors; particularly those that use relevant knowledge. According to many empirical studies, economic diversification makes performance of the economy better over the long term (see, for example, Leiderman and Maloney, 2007; Hesse, 2008).

In addition, economic diversification gives an opportunity for self-discovery, reduce macroeconomic volatility and shield shocks that harm the economy (Alan, 2010). However, diversification of the economy is not a random process and without planning about where countries should diversify their economies depends to a large extent on their circumstances and requirements of the state. The motives to diversify must be clear because the policies will be depending on these motivations, not only because they want to diversify away from oil (Alan, 2010). That was the situation Libya found herself and now finding it difficult to develop other sectors that are as good as oil. This means that a much better outlook of subsistence after the oil era is over is imminent. This can only happen when there is a good policy that allow for the development sector and create a good environment for the work leading to the development of the economy and make it more versatile. The government should be supportive and encouraging in the first steps to diversify by studying the sectors or industries, such as fisheries, that could be a priority in the process of diversification and to be supportive in the organisation of the market, prevent market failure, and creates a private sector capable of producing goods that can compete in local and international market.

Libya is limited in the ability to compete through sectors which have nothing to do with resources, whereas, for long-term economic management, it is best to stay close to the sectors that offer competitive advantage, and the production, local consumption and exports of resources available. Diversifying Libya's economy away from oil will not be easy but it has to start so as to create a sustainable future for the country. For example, this research has chosen the marine sector which has the capacity to contribute to the diversification of the Libyan economy, not just because this sector has a comparative advantage, but also because it provides easier and better opportunity to start as a model for diversification. The questions are: are the odds of success greater than the odds of failure in terms of success? Answers can be found in chapter 11. In the meantime, the second part of this chapter the role of fish and other animal protein in food security and self-sufficiency. Having presented various food gaps and self-sufficiency analysis, the researcher argues for massive development of fisheries to attaining self-sufficiency of not only food, but including the essential proteins required to build a healthy population that would steer the future of Libya.

3.5 Agriculture and Self-sufficiency

Libyan agricultural sector comprises crops, livestock, fisheries and forestry. The largest portion of the agricultural sector is crops and livestock with 71% and 28% share respectively, followed by fisheries (0.39%) and forestry by 0.1% (Elbeydi, 2013). The major crops produced are potatoes, dates, tomatoes, olive, watermelons and onions. Almonds, grapes and groundnuts are also produced at smaller quantities. Figure 3.8 shows the quantities of main crops and animal products for the year 2008. Since the expansion of the oil industry, the Libya government heavily subsidised the importation of food, causing 75% of the food to be imported, particularly animal products. While the demand for food from 1970 to 2007 grows to an average 8.7%, food import demand increased by about 11.1% over the same period (Al-saeh, 2010).

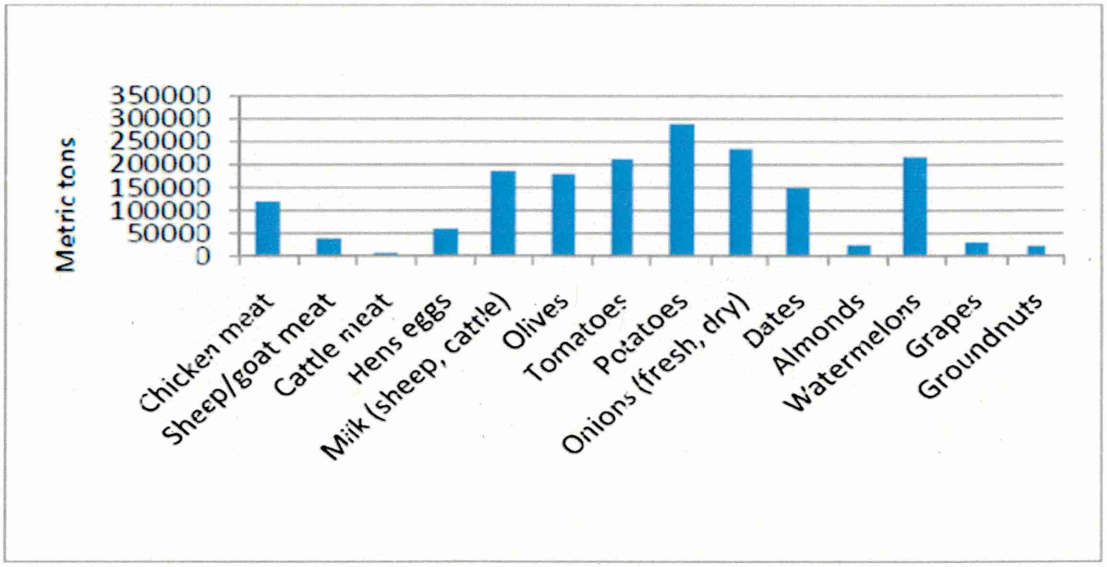


Figure 3.8: Quantities of main crops and animal products in 2008
Source: FAO (2011)

Because of the good profits marketers/exporters are making from the subsidy, certain food supply with greater profit opportunity has grown geometrically since the 1970s, thus making Libya self-sufficient in fruit and vegetables, dairy products and poultry (World of Information 2006; Otman and Karlberg 2007). According to FAO (2011), the main imported animal products are milk, chicken meat and eggs, and small ruminant meat. This food category largely supplies people's energy requirements and make them competitive to fish consumption. Other food crops that provide micronutrients are short in supply. For example, Libya is totally dependent on import market for cereals (FAO, 2011). As figure 3.9 indicates, the demand for cereal has increased since 2009/2010 and the import market is continually depended upon for supply. Taking into account both internal production and importation of some food types, Abuarosha (2013) believe that Libya is self-sufficient in agricultural foods such as vegetables, eggs, dates, olives and poultry meat, despite the significant food gap for many important foods, such as cereal and barley.

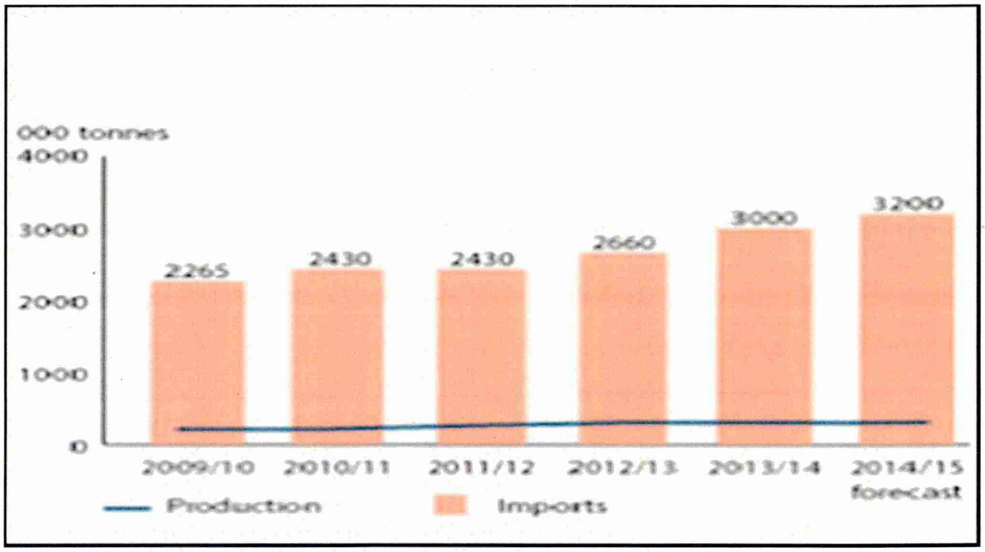


Figure 3.9: Total cereal production and import in Libya
Source: GIEWS Country Briefs (2015)

In addition, figure 3.10 below highlights main food imports in 2008. There is variation in the amount of money spent on the importation of essential commodities, such as wheat/flour, wheat/grain, maize, barley, meat, milk, oil and sugar in sequential order. There is also variation in the quantity (the number of tonnes) imported due to supply and demand factors. The highest quantity of food imported in 2008 was wheat grain, which peaked at 800,000 tonnes and the lowest were meat, milk, oil and maize which was less than 100,000 tonnes (FAO, 2011). Figure 3.11 shows that around US$3.5 billion was spent at the peak of food import in 2008. Before the oil bust of 2008, Libya had generated surplus revenue and used part of it for massive food import at the onset of global food crisis of that year. Also, private individuals engaged in massive food importation so as to enjoy the subsidy. The next section examines animal related food self-sufficiency.

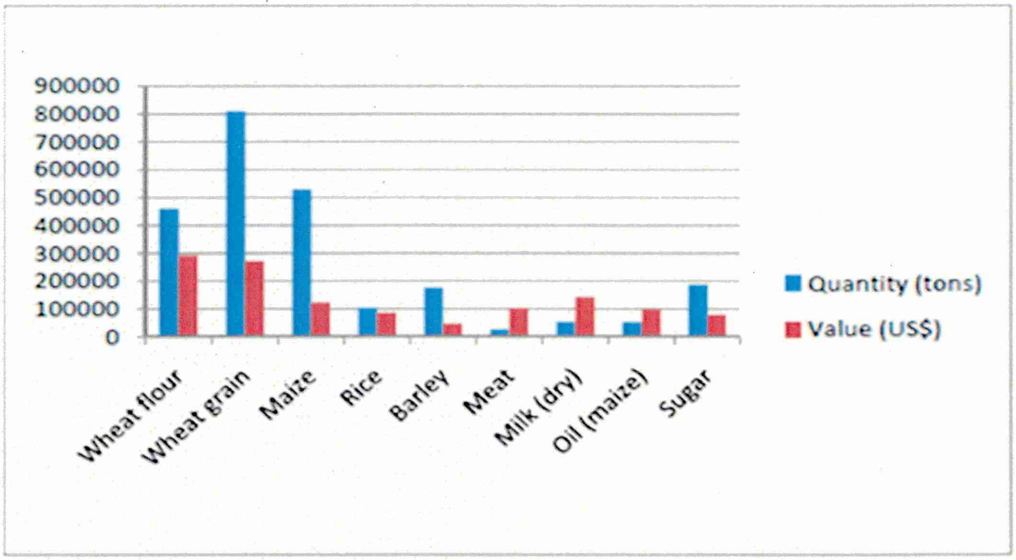


Figure 3.10: Main food import in 2008
Source: FAO (2011)

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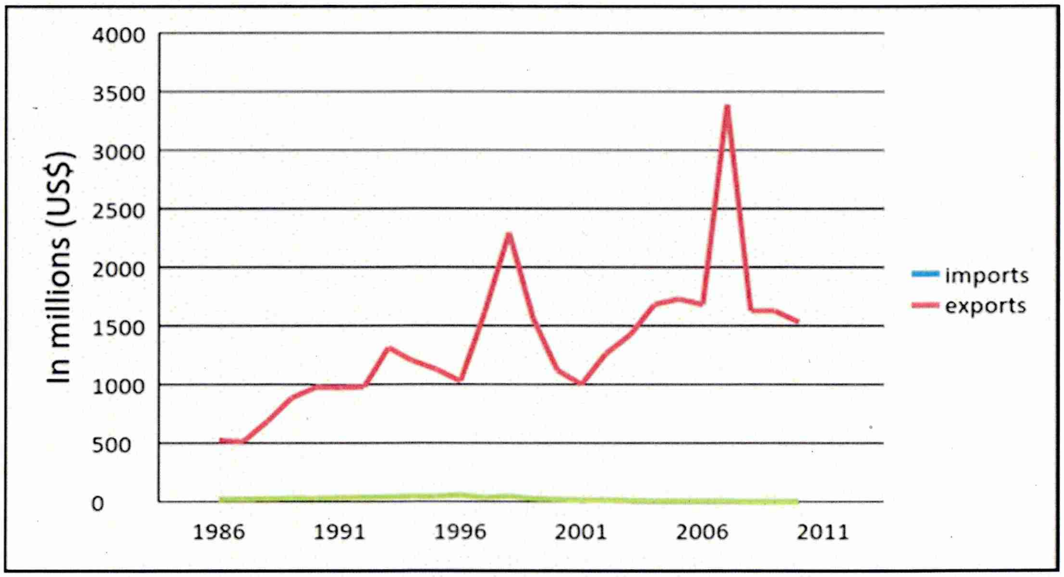

Figure 3.11: Libyan agricultural exports and imports from 1986-2010
Source: AOAD, different years

According to Murphy et al. (2003), animal source foods that are rich in protein and micronutrients supplement those that cannot be obtained from plant sources alone. For example, animal food provides meat that is the most important source that supplies the human body with protein-rich essential amino acids (Mohammed, 1996), but are more resource-intensive to produce than plant-based sources. Animal protein capacity in Libya includes the whole production of red meat, poultry meat, and fish. Following the productive and consumption capacities of animal protein sources; time series analysis technique[17] was used to examine the productive and consumption capacities of animal protein from different sources in terms of trends and evolution over a 20 year period (from 1991-2011). It also assesses the relative importance of animal protein. Even though time series analysis is usually built on the assumptions of stability and linearity; it must be noted however that, most time series results are not linear or follow the normal distribution curve (Salem and Kalf, 2008).

3.5.1 Production capacity and self-sufficiency of red meat

This section shows the production capacity of sheep, goat and beef, taking into account the evolution of production capacity for each type of meat from1991to 2011 .

A- The production capacity of sheep and goats

As Table 3.16 illustrates, the total production capacity of sheep meat ranges between a minimum of 29.48 thousand tonnes in 1992 and a maximum of about 48.97 thousand tonnes in 1996, with an average capacity of 37.32 thousand tonnes for the period (1991-2011). The production capacity represented 20% of the total capacity of local meat production for the period of study (1991-2011). Sheep meat production came second in terms of animal protein produced locally after poultry, while the annual increase amounted to just about 0.293[18] tonnes per year. According to Alaerg (2007), the small production capacity of sheep meat could be attributed to the degradation of the natural grasslands as a result of overgrazing and the lack of rain and forage availability. For example, sheep flocks graze wheat and barley mainly on government reserved areas or on private farms. Al-Masri (2000) citied Alaerg (2007) agrees that improvements in feed manufacturing have reduced sheep production constraint, but argued that the concentrates used as raw material in feed processing depend on foreign market availability. Since local production is not bridging demand, foreign market was relied upon to reduce the difference.

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[17] Time Series: a collection of observations x_t, each one being recorded at time t. (Time could be discrete, $t = 1, 2, 3\ldots$ or continuous $t > 0$.). Time series processes are often described by multiple linear regression (MLR) models of the form: where Y_t is an observed response and X_t includes columns for contemporaneous values of observable predictors. The partial regression coefficients in *B* represent the marginal contributions of individual predictors to the variation in Y_t when all of the other predictors are held fixed (MathWorks, 2015).

[18] $Y= 34.096+ 0.293\ X$ (Linear equation to show the rate of increase)

Table 3.16: Production capacity of local meat (1991- 2011) (in thousand tonnes)

Year	Total meat	sheep and goat	%	beef	%	Total red meat	%	poultry	%	fish	%	Total white meat	%
1991	163.15	29.55	18.11	30.60	18.8	70.75	43.4	66.300	77.5	19.206	22.46	85.506	56.6
1992	162.58	29.48	18.13	26.60	16.4	66.08	40.6	67.600	74	23.788	26	91.388	59
1993	171.34	35.48	20.70	25.60	14.9	68.68	40.1	71.500	73	26.685	27	98.185	59.9
1994	177.18	31.02	17.51	22.10	12.5	59.80	33.8	83.790	71.4	33.500	28.56	117.290	66
1995	202.04	35.67	17.65	21.60	10.7	64.74	32.0	100.280	79.5	25.810	20.46	126.090	68.0
1996	204.34	48.97	24	14.50	7.1	71.26	34.9	100.000	76.8	30.203	23.2	130.203	65
1997	214.05	38.97	18.2	40.00	18.7	83.07	38.8	99.000	72.8	36.845	27.12	135.845	61
1998	223.08	44.97	20.16	44.00	19.7	92.07	41.3	98.000	72.6	37.000	27.4	135.000	58.7
1999	190.55	39.97	21	16.00	8.4	59.45	31.2	98.150	72	38.000	28	136.150	68.8
2000	182.60	38.67	21.2	8.20	4.5	50.57	27.7	98.540	83.4	19.617	16.6	118.157	72
2001	181.16	37.34	20.6	7.73	4.3	48.77	26.9	99.060	82.1	21.567	18	120.627	73
2002	179.23	36.01	20.1	7.25	4.0	46.76	26.1	98.800	83.3	19.831	17	118.631	73.9
2003	177.62	34.68	19.5	6.78	3.8	45.16	25.4	98.800	81.5	22.375	18.46	121.175	74.6
2004	176.15	33.35	19	6.30	3.6	43.35	24.6	98.800	72	38.510	28.04	137.310	75.4
2005	163.100	30.00	18.4	6.00	3.7	36.000	22.1	99.000	78.5	27.100	21.5	126.100	77
2006	178.216	34.00	19.1	6.00	3.4	40.000	22.4	99.000	71.6	39.216	28.4	138.216	77.5
2007	200.352	37.00	24.1	10.00	6.5	47.000	30.6	120.000	78.2	33.352	22	153.352	76.5
2008	195.400	40.00	20.5	10.00	5.1	50.000	25.6	120.000	82.5	25.400	17.5	145.400	74
2009	189.712	42.00	22.1	10.00	5.3	52.000	27.4	120.000	87.1	17.712	13	137.712	72.6
2010	187.000	43.00	23	9.00	4.8	52.000	27.8	129.000	85.1	22.604	15	151.604	81
2011	180.100	43.50	24	8.00	4.4	51.500	28.6	123.500	72	48.300	28	171.800	95
Average	185664	37316	20.3	16012.4	8.6	57095.7	30	99482	77.5	27236.3	22.5	134787	70

Source: Unite Nation, Food and Agriculture organization, year book, different volumes; AOAD, Yearbook statistics; Arab Monetary Fund Statistical Tables, and National Foundation for Maritime Investment (2005)

B- The production capacity of beef

Table 3.16 demonstrates the total production capacity of beef. Beef was trending at a minimum of about 6,000 tonnes in 2005 and 2006 to a maximum of about 44 thousand tonnes in 1998. By studying the general time trend of the production capacity of beef, it becomes clear that production capacity of beef decreased; the annual decrease amounted to about 1.266 [19]tonnes in the period of the study (1991-2011). The decrease in the relative importance of beef from its declining production is due to the obstacles facing breeding – that is cattle need green fodder which does not grow on a large scale in Libya because of water scarcity. Moreover, cattle demand open natural pastures which are not available in Libya. Alaerg (2007) strongly argue that Libya is not the place for cattle and goat rearing due to the above mentioned constraints. However, scholars such as Vercoe (2000) have suggested ways of overcoming climatic and environmental factors affecting dairy and beef production, including heat control, feeding, breeding and shelter. To boost production and adaptability of cattle in Libyan environment, Vercoe (2000) suggestion can be tested.

c- The production capacity of white meat protein

1- Poultry meat

The production capacity of poultry meat is illustrated in Table 3.16. According to Alaerg (2007), the growth in poultry meat production is generally due to the ease of management and the use of modern technologies. Chicken has lower prices compared to red meat and that has led to an increase in its demand. Poultry industry has been known in Libya since 1968. It has since expanded for the past three decades, largely becoming a prominent livestock production (Shrah, 1989). It is worth mentioning that poultry in Libya is limited to chicken meat as the other species make up a small percentage (Alaerg, 2007). Despite the large increase in broiler production, the industry faces many problems. It is entirely dependent on imports from abroad to meet its basic requirements; therefore, it is directly linked to fluctuations in global market prices, starting from the price of a chick to feeding and machinery. Poultry production is thus, exposed to volatility (Otaloppe, 1998).

Table 3.16 shows the total production capacity of poultry meat from a minimum amount of 66,300 tonnes in 1991 to a maximum of 129,000 in 2009. The average annual production is estimated to be 99,482 tonnes. By studying the general trend of the total production capacity of poultry meat during (1991 -2011), it becomes evident that poultry meat production increases to about 2.446[20]thousand tonnes annually.

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[19] $Y= 29.934 - 1.266 X$

2- Fish capacity

As mentioned in chapter one, Libya's marine environment allows the production of copious quantities of fish, which could give it an advantage compared to other products. Libya could achieve self-sufficiency in fish, considering the small Libyan population (Alaerg, 2007). In 2010, fish local production in Libya amounted to 48,300 tonnes, approximately 12 % of the total meat production for that year. Table 3.16 reveals that the minimum total production capacity of fish was about 19.206 tonnes; it continued to increase until it reached a maximum of 48,300 tonnes, representing an annual average of 27.236.3 tonnes from 1991to 2011. The study of the temporal trend revealed that the production capacity of fish has been on a growing trend: increasing to about 0.229[21] tonnes annually.

It can be concluded that the annual production capacity of sheep meat increase slowly at a rate of 0.293 tonnes per year, while the production capacity of beef decreased to about 1.266 tonnes per year. The annual poultry production capacity rose remarkably; it reached 2.446 tonnes per year while fish production advanced slowly at a rate of 0.229 tonnes. To sum up, the increase in animal protein production rate depends on an increase in poultry production rates followed by sheep, goat and fish. The production of poultry meat is, however, hampered by importation of materials such as animal feed, which also account for sharp fluctuation of prices. Price uncertainty results in supply interruption coupled with difficult environmental conditions - a lack of water and the scarcity of pastures– that affect sheep and goat productivity in Libya (Alaerg, 2007). Conversely, there is all-year-round catch and the naturally long coastline provided a niche for fisheries husbandry, thus availing even a greater opportunity to meet the demand for animal protein. However, feeding all Libyans, while also advancing nutrition intake in the midst of conservation and sustainability is one of the greatest challenge of any post-conflict reconstruction of Libya.

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[20] $Y= 72.577 +2.446\ X$

[21] $Y= 26.363 + 0.229\ X$

3.5.2 Consumption capacity of animal protein and food gap in Libya (1991-2011)

Piana (2001) is one of those authors that judge the economic performance of a country mainly in terms of consumption level dynamics. Shepherd (1985), Ritson and Hutchins (1995) and Marshall (1995) have analysed how countries' economic, social and psychological factors affects their consumption pattern (see section 5.3, chapter 5 for an example of such analysis by Shepherd, 1985). Table 3.17 detailed different animal protein sources and the difference in the capacity of such food sources to satisfy demand and consumption level.

Table 3.17 The evolution of the consumption capacity of local meat, according to the sources of animal protein in thousand tonnes during the period (1991- 2011).

Year	Total red meat	food Gap	fish Available	food gap	Chicken	food gap	Total white meat	food gap
1991	76.67	-5.92	25.096	-5.89	66.66	-0.36	91.756	-6.25
1992	74.52	-8.44	29.248	-5.46	68.15	-0.55	97.398	-6.01
1993	72.91	-4.23	30.635	-3.95	72.20	-0.7	102.835	-4.65
1994	71.61	-11.81	31.99	1.51	84.64	-0.85	116.63	0.66
1995	69.30	-4.56	23.82	1.99	98.46	1.82	122.28	3.81
1996	74.81	-3.55	28.883	1.32	100.66	-0.66	129.543	0.66
1997	68.78	14.29	34.115	2.73	99.30	-0.3	133.415	2.43
1998	64.49	27.58	34.27	2.73	98.13	-0.13	132.4	2.6
1999	76.72	-17.27	36.17	1.83	98.18	-0.03	134.35	1.8
2000	67.91	-17.34	17.697	1.92	99.19	-0.65	116.887	1.27
2001	65.49	-16.72	24.917	-3.35	99.56	-0.5	124.477	-3.85
2002	61.87	-15.11	17.411	2.42	102.00	-3.2	119.411	-0.78
2003	62.5	-17.34	19.955	2.42	101.38	-2.58	121.335	-0.16
2004	81.68	-38.33	32.61	1.39	100.06	-1.26	132.67	4.64
2005	80.01	-44.01	46.07	-18.97	99.08	-0.08	145.15	-19.05
2006	60.46	-20.46	54.036	-14.82	99.08	-0.08	153.116	-14.9
2007	67.46	-20.46	50.272	-16.92	120.08	-0.08	170.352	-17
2008	70.46	-20.46	40.25	-14.85	120.02	-0.02	160.27	-14.87
2009	76.4	-24.4	32.562	-14.85	120.1	-0.1	152.662	-14.95
2010	73.15	-21.15	37.454	-14.85	129.07	-0.07	166.524	-14.92
2011*	71.18	-19.68	*63.15	-14.85	123.57	-0.07	186.72	-14.92
Average		-13.779		5.17				-5.45

Source: Unite Nation, Food and Agriculture organization; AOAD, Yearbook statistics; Arab Monetary Fund, Statistical Tables, all different years. * Estimation (AOAD)

Table 3.17 shows that the consumption capacity of red meat in Libya which reveals wide food gap from 1991-2011. The data shows total maximum gap of about 44.01 thousand tonnes in 2005 and an overall annual average of 13,779 tonnes covering the 20 year period. Consumption capacity generally decreased from 1991 to 2003 and then returned to an upward movement reaching 81,000 tonnes in 2004. It started falling again to about 71,000 tonnes in 2011. The study of general time trend of consumption capacity shows that the annual decrease mounted about 0.088[22] thousand tonnes, the average of food gap of red meat and white meat are 13.779 and 5.45 thousand tonnes respectively. The consumption capacity of poultry in Libya reveals that the food gap for the same period is negligible, with a total maximum of about 3.2 thousand tonnes in 2002 (see table 3.17). The study of general time trend revealed that the consumption capacity of poultry meat has taken years on a growing trend. The annual increase mounted to about 2.447[23] thousand tonnes. Taking into account the growing trend in poultry consumption, Libya will need to produce more poultry for the next 10 years to close the gap and accommodate diet changing behaviour.

Table 3.17 demonstrates the total consumption capacity of white meat; it was trending at a minimum of about 112.53 tonnes in 1991 to a maximum of about 186,720 tonnes for the period in 2011. The general time trend of the consumption capacity of white meat increases to about 3.515 tonnes per year. Table 3.17 demonstrates the total consumption capacity of fish. It was trending at a minimum of about 20,002 tonnes in 2009 to a maximum of about 51,526 tonnes for the period (1991-2011). The general time trend of fish consumption capacity from the equation shows an increase to about 0.774[24] tonnes per year. It can be concluded that the annual consumption capacity of red meat is decreasing, while the annual consumption capacity of white meat rose remarkably. However, the increase in consumption capacity of white meat comes from the increase in the consumption of poultry meat, while fish production is increasing slowly. The total fish production has been growing at a rate of 0.229 tonnes per year since 1991, while Libya's population has been expanding at an annual growth rate of around 1.3%. However, the share of fish proteins in animal proteins is gradually increasing because of increasing consumption of other animal products, such as poultry and white meat.

3.5.3 Animal Protein Gap

1- Food gap of animal protein and self-sufficiency in fish

The food gap, caused by insufficient domestic production of some food commodities, is a primary reason for not meeting the growing needs of people (Saleh, 2000). Thus, it is necessary to bridge that gap by improving and increasing local food productivity that guarantee adequate intake of essential micronutrients and one which provides adequate calories for an active and healthy life. Where local production is not possible due to local conditions, it can be supplemented by increasing imports. The consequence of the latter is a possible absorption of a large part of foreign currency resulting in a trade deficit. Figures 3.12 and 3.13 demonstrates food gap in animal protein. The consumption capacity of animal protein in Libya reveals a food gap for the period from 1991 to 2011. The review of the data in Table 3.17 highlights the gap in the total red meat consumption in Libya which range from a minimum of about -3.55 thousand tonnes in 1996 to a total maximum of about 44.01 in 2005, while the annual average was about 13,1243 tonnes. The food gap of chicken is small; it did not exceed 2,000 tonnes throughout the study period with the exception of year 2002 where the food gap reaches 3,200 tonnes. Libya's poultry industry expansion is as a result of increased investment from government, including local and foreign investors. Commercial poultry employs about 14,000 out of the estimated 180,000 people working in the agricultural sector (Guèye, 2004).

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[22] $Y= 71.849- 0.088 X$

[23] $Y= 73.063+ 2.447 X$

[24] $Y= 24.250+0.774 X$

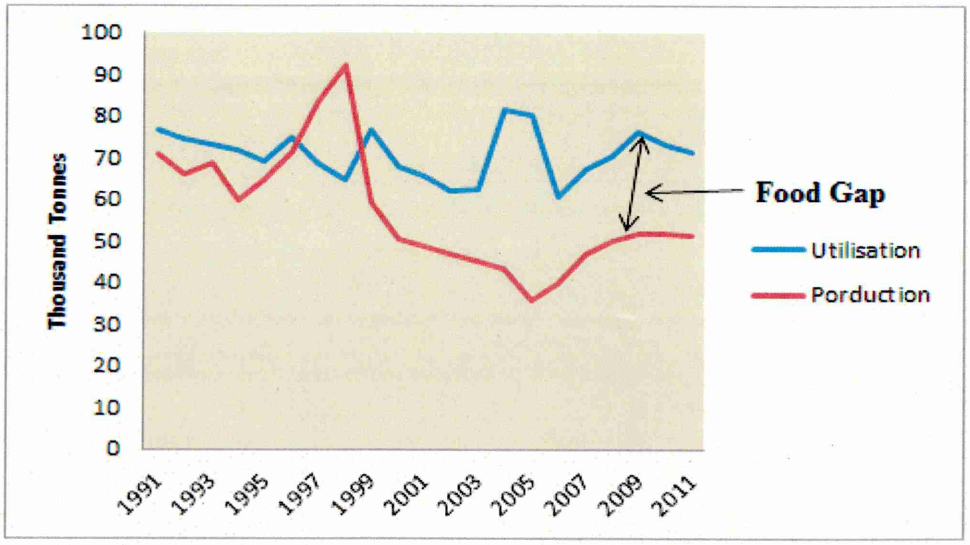

Figure 3.12: Domestic red meat production and utilisation

Fish production for instance, Table 3.18 indicates that in 2005 the food gap reach 18.97 tonnes; this current rate is probably the highest since 1991. The table also shows that there are some years with no food gap. The food gap of fish for the study period ranged from a minimum of about 3.95 tonnes for 1993 to a maximum of about18.97 tonnes for 2005. This mean the gap had increased during the period of the study. The size of the food gap depends on both production and consumption - increased production leads to a gap contraction and increased consumption leads to gap widening. Because the factors affecting growth in consumption may impact factors affecting production, it would consequently increase the size of the food gap with the passage of time (Alaerg, 2007).

Table 3.18: Food gap, self-sufficiency and fish consumption in Libya (1991-2011)

Year	*Domestic production tonnes	Fish Available for local consumer / tonnes	Population person	Food gap tonnes	% Self-sufficiency	Apparent fresh fish consumption (as weight per inhabitant) kg/year
1991	19.206	25.096	3.930	-5.89	76.53	6.39
1992	23.788	29.248	4.041	-5.46	81.33	7.24
1993	26.685	30.635	4.156	-3.95	87.11	7.37
1994	33.500	31.99	4.274	1.51	104.72	7.48
1995	25.810	23.82	4.390	1.99	108.35	5.43
1996	30.203	28.883	4.519	1.32	104.57	6.39
1997	36.845	34.115	4.648	2.73	108.00	7.34
1998	37.000	34.27	4.769	2.73	107.97	7.19
1999	38.000	36.17	4.895	1.83	105.06	7.39
2000	19.617	17.697	5.125	1.92	110.85	3.45
2001	21.567	24.917	5.300	-3.35	86.56	4.70
2002	19.831	17.411	5.484	2.42	113.90	3.17
2003	22.375	19.955	5.827	2.42	112.13	3.42
2004	34.00	32.61	5.873	1.39	104.26	5.55
2005	27.100	46.07	6.077	-18.97	58.82	7.58
2006	39.216	54.036	5.637	-14.82	72.57	9.59
2007	33.352	50.272	5.777	-16.92	66.34	8.70
2008	25.400	40.25	5.877	-14.85	63.11	6.85
2009	17.712	32.562	5.964	-14.85	54.39	5.46
2010	22.604	37.454	6.3	-14.85	60.35	5.9
2011	*48.300	63.15	6.103	-14.85	76.48	10.35
Average	28.67	33.84	3.930	5.17	88.73	6.53

Source: Table 3.18 and 3.19
Fish Available = Domestic production + import - export (see table3.17)
Food gap = Domestic production - Fish Available.
Self-sufficiency % = (Domestic production/Fish Available)*100.
Apparent fresh fish consumption = Fish Available (kg)/Population.
* Estimation (AOAD)

Figure 3.13 displays Food gap in terms of quantity and self-sufficiency from 1991-2011

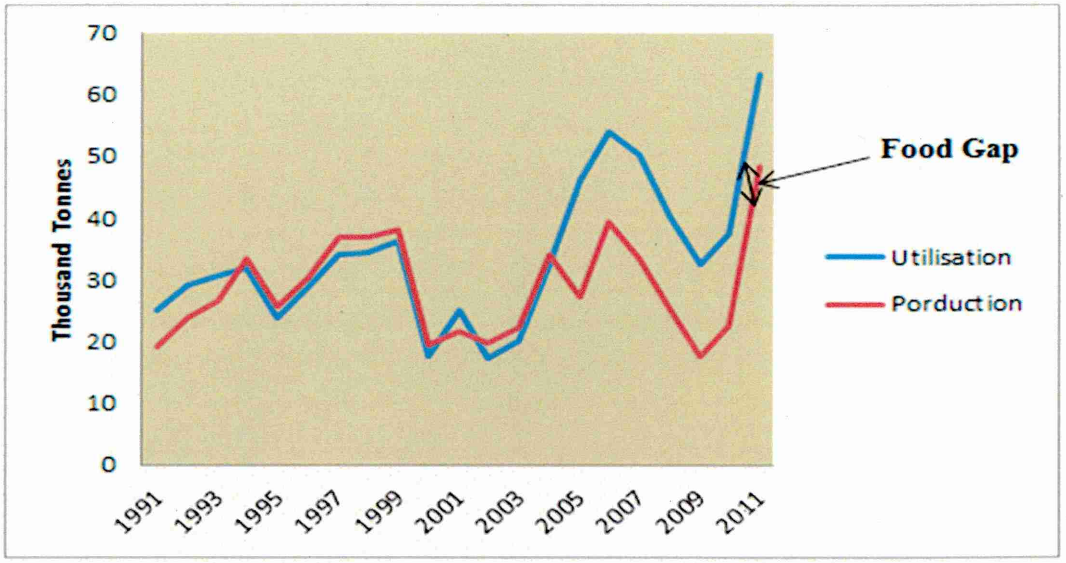

Figure 3.13: Food gap in terms of quantity and self-sufficiency from 1991- 2011

Linear equation[25] clarified that the food gap for fish took a general trend growing annually by about 0.198 tonnes. From equation[26], self-sufficiency in fish is decreasing to the annual production level of about 0.477 tonnes per year, despite the existence of surplus from 1997 to 1999, as well as the disappearance of the food gap in 2004. The average fish consumption per capita of Libya is still low when compared to average fish consumption in neighbouring countries. Libya's average consumption during the period (1991-2011) stands at 6.5kg, while it was on average 16.6 kg between 2010 and 2011 in Egypt and in Tunisia; 17.5 and 12.9 kg/year from 2007-2009 (FAO, 2011; FUS, 2011; Al shbah, 2014; AL Wafd, 2015). Chapter nine of this thesis provided answers to why there is lower average fish per capita in Libya and the factors affecting production were identified in section eight.

In addition to the problems of fisheries catalogued in chapter one , fundamental drivers behind the rise in Libya's food/fish gap are: underdevelopment of agricultural sector unsustainable food subsidy and planning system for the entire agricultural sector (Elmessallati, 2007), and the conflict/political instability that is now rapidly deteriorating Libya's economic environment and exacerbating the challenges facing agriculture and fisheries. Under current conditions (2011 to date), weakness to fish supply may continue to spread through the population. If the current conflict lingers and the country is not stable to implement major reforms, a higher risk of fish supply crises and wider margin of food gap may ensued in the coming years. Meanwhile, figure 3.14 is an example of how fish contributes to food security, nutrition and national income with attendant multiplier effects to the country.

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[25] $Y= 9.192 + .198 X$

[26] $Y= 82.240 - 0.477X$

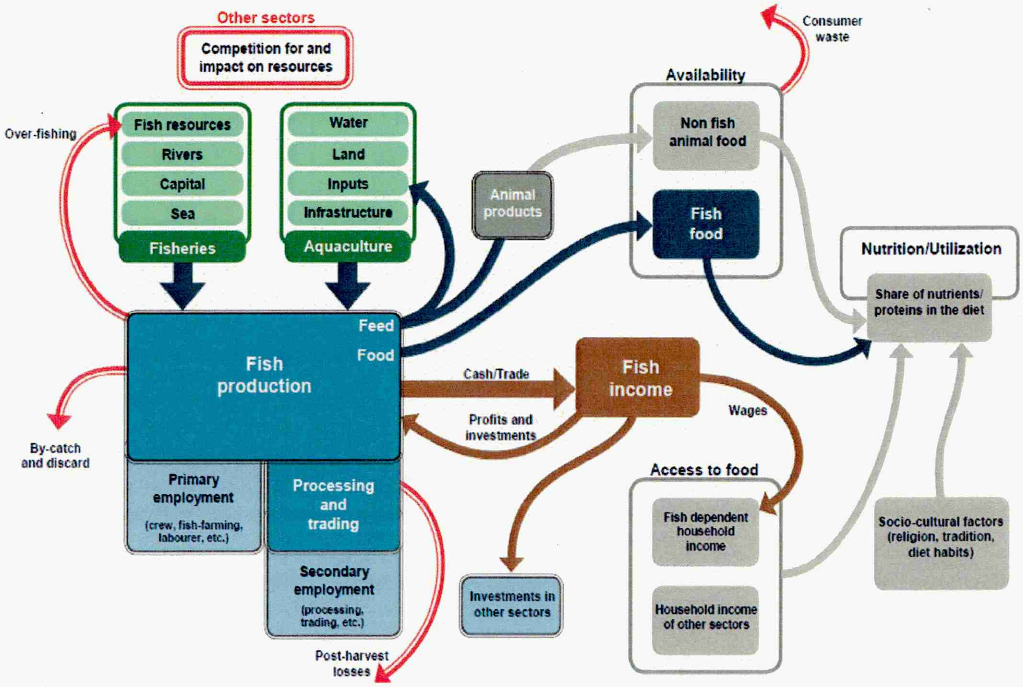
Other sectors
Competition for and impact on resources
Over-fishing
Fish resources
Rivers
Capital
Sea
Fisheries
Water
Land
Inputs
Infrastructure
Aquaculture
Animal products
Consumer waste
Availability
Non fish animal food
Fish food
Nutrition/Utilization
Share of nutrients/ proteins in the diet
Feed
Food
Fish production
Cash/Trade
Fish income
Profits and investments
Wages
By-catch and discard
Primary employment
(crew, fish-farming, labourer, etc.)
Processing and trading
Secondary employment
(processing, trading, etc.)
Post-harvest losses
Investments in other sectors
Access to food
Fish dependent household income
Household income of other sectors
Socio-cultural factors (religion, tradition, diet habits)

Figure 3.14: Different pathways of fish contribution to food security and national economy
Source: HLPE (2014:28)

Climatic conditions and the scarcity of water make agriculture in Libya weak to support food security. The World Food Summit of 1996 defined food security as existing “when all people at all times have access to sufficient, safe, nutritious food to maintain a healthy and active life”. In addition, Breisinger et al. (2010) demonstrated that Libya faces food security challenges and depends heavily on imports for most of its agricultural products owing to its low productivity, climatic conditions and poor soils that limit domestic output. Improving on these conditions and difficulties, according to Mazar (2012), leads to the extraction of more water, which to a large extent, rapidly depletes the renewable sources together with an increasing reliance on other high-cost sources. As mentioned earlier, attaining food self-sufficiency is not feasible because of the volatility of imports and government’s over-reliance on oil revenue to subsidise the importation of food. Achieving a self-sufficient food future, then, requires paying serious attention to Libyan coast with the aim of sustainably utilising the abundant food (fish) resources to close the food gap and be self-sufficient in fish production and consumption. Sections 1.5 to 1.7 in chapter one have introduced the potential and challenges of fish development in Libya. There is comparative advantage in the fisheries sector that could be turned into a competitive sector. It could play a significant role in promoting food security especially as fish protein has great health benefits. According to Porter and Yergin (2006), Libya's geographical position provides an attractive link to Europe. Libya's comparative advantage based on its geographical location (i.e. an easy link between Africa and Europe) can help not only in diversifying the economy, but in sectorial development such as opportunities for transit-trade cluster, marine services, trans-shipments, ship-building and repair and other value-add services. The development of these clusters is only possible with significant investments in the already highly competitive environment from other Mediterranean regions. This means no one solution can create sustained food self-sufficiency. A combination of choices based on production, consumption and strategies, including those mentioned above, can close the food gap and generate a healthy manpower that would drive the Libyan economy.

3.6 Summary

The main purpose of this chapter was to examine the historical development of Libyan economy and to analyse the problem of food gap. Libya has undergone several stages of political and economic development of different duration by under different structure. Monarchy that ruled prior to 1969; the Jamihiriyya (Socialist system) came into being as a political and organisational model to overcome the shortcomings of the preceding monarchy. The Socialist system led by Ghaddafi established a constitution, namely *the Green Book*, which instituted a vertically organized in-direct democratic model that comprises People's Committees who are also responsible to People's Congresses from national, regional and local level. In reality, only Ghaddafi and his acquaintances have the political authority to call for alterations or any amendment in the economy and push them through, as any ideology initiated by the General People's Committee requires his/their approval. The seemingly direct-democratic system has been in place from 1970s till Ghaddafi was ousted out of power in 2011. In each of this political system, a number of economic reforms and strategies were outlined, from the time where the country relies on agriculture as a means of survival to the period when oil was discovered. Prior to the 1990s Libya operated a socialist system financed by surplus oil revenue, but the trend changed since the late 1990s towards increasing private enterprise and a free-market economy. However, domestic and foreign political developments have influenced political and economic transformation of the country. As indicated in various sections, all the economic development plans post-oil production gradually de-emphasises agriculture in favour of services sectors. Even when the share of agriculture increased, the problems with implementation existed due to governance weakness, bureaucratic procedures and competence problems with institutions. These problems have resulted in concentration of government direction to oil, delayed decision-making and poor decisions. For example, achieving self-sufficiency through agriculture is one of the political slogans of economic independence made by the 1969 coup plotters. A number of measures were taken, such as expanding irrigation and animal husbandry, but these measures have not been sustained.

The chapter has shown that the surge in demand for food spurred by rise in oil revenue and population increase is widening the gap between food supply and demand. This has resulted in huge increases in food imports in Libya since the 1970s. As the opening paragraph in part II indicates that the performance of agriculture in Libya has not kept pace with increasing demand. Libya has made far-reaching efforts at reducing the food gap that widened since the late 1970s and that involved heavily subsidising food import of up to 75% of annual demand. Because cereals, including barley and wheat are the preferred staple cereal for direct consumption, agricultural policies since the 1970s have concentrated on increasing their production more than any other staple food. In recent years, however, as eating behaviour changes and food preferences have altered food consumption, the demand is not keeping pace with supply. The higher demand for primary livestock products has led to increased poultry production capacity, especially of poultry and eggs. The study of the temporal trend shows that while annual production capacity of sheep meat increases, that of beef decreased from 1991-2011. The increase in fish production is lower than those of poultry and sheep meats. This means that even as the production of poultry meat is hampered by importation of animal feed, it has received more attention than fish. Generally, result shown in Table 3.18 shows a general deficit between animal's protein demand and supply. It implies that Libya is not self-sufficient in animal's protein and that all the various economic strategies have not translated into national food security and self-sufficiency. As the focus of this research is on fish and Libya has the capacity to be self-sufficient in fish, the next chapter scrutinises Libyan fish sector with the aim of establishing its capacity for self-sufficiency, integration into the wider economy and for export. While this has been elucidated, factors affecting food preferences and those that affect the competitiveness of fisheries are contained in chapter nine.

Chapter Four

Libya Fish Potential, Production and Consumption

4.0 Introduction

Chapter one has shown that Libya is largely dependent on oil and chapters two and three have shown that non-oil's sectors are under-developed and their contribution to the national economy is abysmally low. It has been established in the previous chapter that fish is an important source of animal protein that has great potential in reducing food gap and increase food self-sufficiency in Libya. Increasing revenue from oil production has provided the purchasing power that has made other animal protein sources available, causing changes in eating behaviour and preferences. There is fish in abundance in Libya and more than 95% of the catches are for consumption (Khalfallah et al, 2015). However, most of the catches are made by artisanal fishers (Sea Around US Project, 2015) using traditional or less sophisticated trammel nets, gillnets or hooks - longlines and handlines, Lamboeuf (2003). The aim of the chapter is to provide background information on the Libyan fishing potential and the nature of coastal fishing activities, which would provide a base for the analysis of PDM in chapter eight and nine.

The first section of the chapter presents an overview of the spatial extent of Libya's coastline and fish stock along the Mediterranean and compared fish catch with other Mediterranean basin countries, such as Tunisia, Egypt, Spain, Turkey, Italy and Algeria. In relation to the first section, the second section (4.3) documents the types and number of fish species in Libyan waters as ascertained by various studies. This was followed by types of fleets and gears used in catching fish (section 4.4). The nature of fish trade, including local, import and export markets are presented in section 4.6. The last section before the summary briefly identifies fish consumption trend in relation to some of those countries compared in section 4.7. This was followed by comparison between Libya and some countries located on the Mediterranean Sea in term of quantity of production 4.8. In the third section (4.9), a detailed assessment of fisheries development and its economic significance to the economy of Oman was provided. It was possible to use Oman to draw some lessons for Libya because Oman has some comparative advantages of location similar to Libya, benefits from oil and gas wealth but is non-OPEC member.

4.1 Mediterranean Coastline and Fish Stock

Fisheries and aquaculture are a globally significant source of employment and livelihoods. It is estimated that between 660 and 820 million people (workers and their families) directly or indirectly depend on fisheries value chain for income and livelihood (Allison and de Silva, 2013). In Libya, this sector with enormous potential (i.e. large quantities of white fish, tuna sardine and unexploited sea sponges and coral reefs), but employs less than one-quarter (0.0025%) of Libya's population (Hamza et al., 2011). Chapter eight contains discussion about fishing sector employment. The sector is poorly integrated into the national economy and contributes no more than 9% GDP share to agriculture since 2003 (FAO, 2008; FAO, 2011; Othman and Karlberg, 2007). This is even when the sector has been substantially subsidised through open access to fisheries, loan facilities for boat-building and the absence of rationalisation user charges for infrastructure (General Authority of Marine Wealth, 2011). However, the lack of long-term fisheries management and development policy has led to a disorganised situation to the detriment of sustainable use of marine resources. Other important issues include the poor integration of the fisheries sector in the national economy in terms of national employment and added value, weak fish marketing networks and the need for enhanced protection of the marine and coastal environment (FAO, 2008).

Chapter three has shown that fishing industry was still not important in the 1970s due to oil production. Considerable amount of Libya's fishing fleet during this time was located on the western coast, around Tripoli. Artisanal fishery is very important in the Libyan EEZ[27] and dominates the sector, while industrial fishing is not in operation (Khalfallah et al., 2015). Increasing attention was given to the sector in the 1980s, where port was constructed at Zuwarah (Northwestern Libyan coast) and several ice plants were built to address increasing demand for fish (Metz, 1989). As a result of improvements in Libya's economy, catches increased in the mid-2000s. Since the last decade, Libya has pursued a policy of food self-sufficiency, which purportedly gives attention to fisheries (Abuissa, 2007). In 2005, Libya declared 62 nautical miles exclusive fishery zone from the territorial waters boundaries (Alsied 2006). An

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[27] An Exclusive Economic Zone (EEZ) is a concept adopted at the Third United Nations Conference on the Law of the Sea (1982), whereby a coastal State assumes jurisdiction over the exploration and exploitation of marine resources in its adjacent section of the continental shelf, taken to be a band extending 200 miles from the shore (OECD,2003) https://stats.oecd.org/glossary/detail.asp?ID=884

Exclusive Economic Zone estimated at 355,120 km2 was declared by Libya in 2009 (European Commission 2011) (see figure 4.1 below). All these extensions of water boundaries have provided opportunities for rapid and sophisticated development of fisheries. Alas, this was not the case due to the reasons outlined in chapters eight, nine and ten.

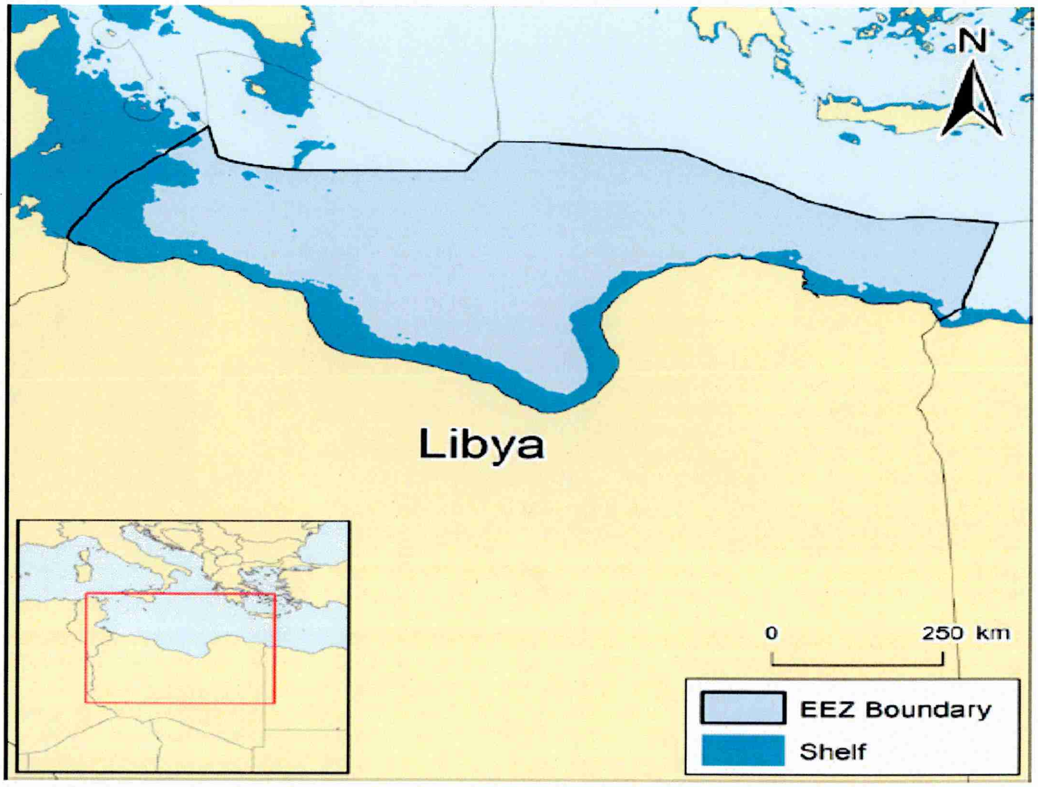

Figure 4.1: Map of the north of Libya's shelf and EEZ-equivalent marine area.
Source: Khalfallah et al. (2015)

On the basis of topography and continental shelf steepness, the Libyan fishing regions are categorised into three: 1) Western region characterised by a wide continental shelf and almost sandy trawlable bottom extends from the Libya-Tunisia border to Musrata; 2) Medial region, characterised by rocky bottom and steep continental slope, extends from Musrata to Benghazi; 3) Eastern region, characterised by narrow continental shelf and a rocky substratum, runs from Benghazi to the Libya-Egyptian border (GFCM,2007), . The Libyan coast along the Mediterranean provides a niche for fishing, as the coastline within Libya's territorial waters have been recognised by Rawag et al (2003) to be fairly unpolluted, and contains marine plants suitable for shelter and breeding by different fauna species. For example, the western coast from west Tripoli, which includes the whole Gulf of Gabes, the Gulf of Sirte and the eastern Cyrenica coast (IUCN,2011) (see figure 4.2), are among the 13 most important Mediterranean marine biodiversity hotspots because of their high content marine and coastal biodiversity (Hamza et al., 2011).

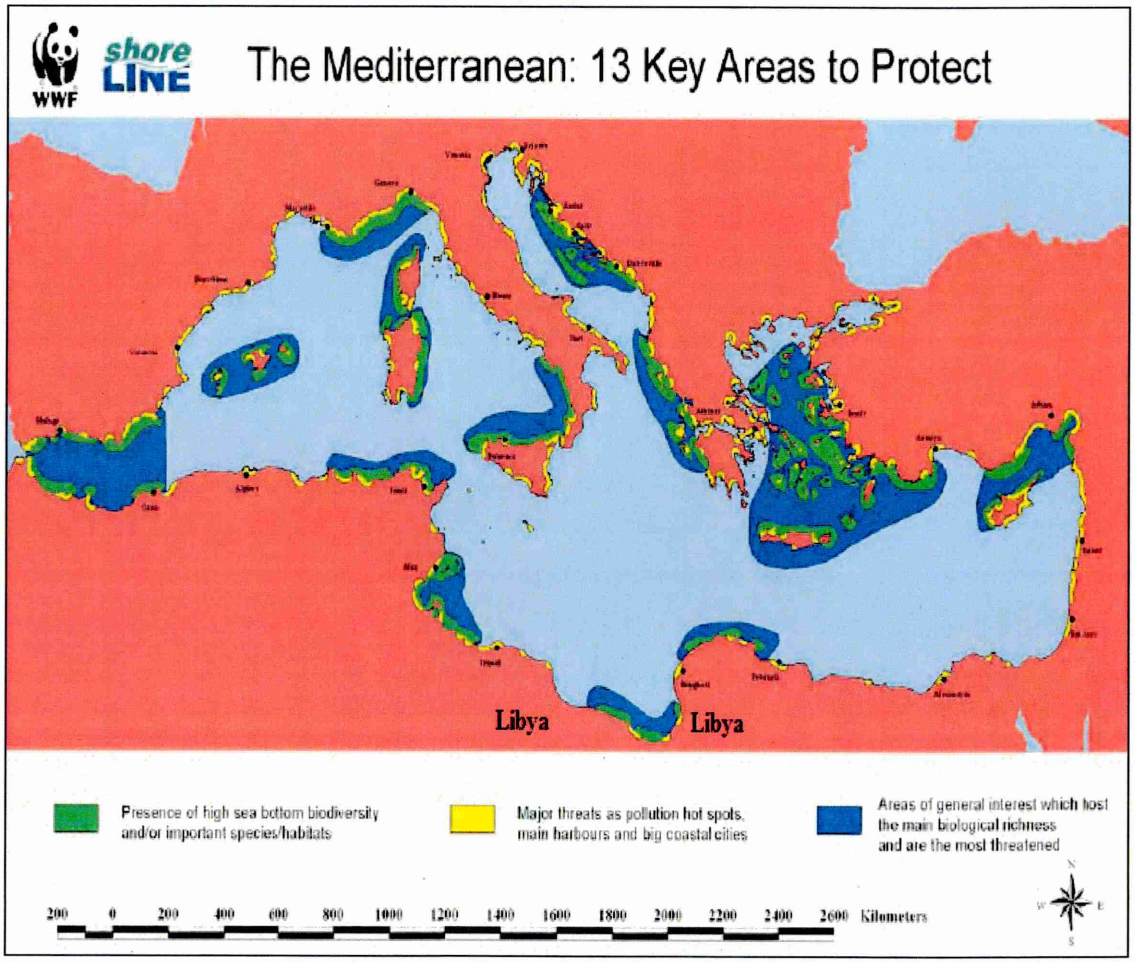
WWF
shore LINE
The Mediterranean: 13 Key Areas to Protect
Libya
Libya
Presence of high sea bottom biodiversity and/or important species/habitats
Major threats as pollution hot spots, main harbours and big coastal cities
Areas of general interest which host the main biological richness and are the most threatened
200 0 200 400 600 800 1000 1200 1400 1600 1800 2000 2200 2400 2600 Kilometers
N
W
E
S

Figure 4.2 Three key high Mediterranean marine biodiversity hotspots identified in Libya.
Source: Modified from (Hamza et al, 2011)

The Mediterranean coastline is composed mostly of fish (ca. 70%), crustaceans (ca. 20%) and molluscs (ca. 10%) (FAO – East-Med Project, 2014). However, there are currently very limited data on the population, community, habitat, and sub-region levels, taxonomy distribution, abundance, and temporal trends of several fish species (Coll et al, 2011), particularly along the Libyan coastline. Where data is available, it is not easily accessible, because the inventories have not been made public. There appears no complete recent study detailed scientific about the fish stocks in Libyan waters; however, there are some preliminary studies and reports that can be use in the formulation of policy for Libyan fisheries development. This thesis is systemic and more comprehensive than these reports, as it catalysed the various sectors of fisheries with the aim of identifying how the sector can be highly competitive and contribute to national economy. In the mid-90s, Maximum Sustainable Yield (MSY)[28] for the western Libya demersal and small pelagics fisheries was estimated at 12,600 and 21,500 tonnes per year respectively (FAO, 2008). These figures are not inclusive of those species found in the central and eastern part of the country due to limitations in official data from these regions. Total fish production, according to official data, ranges from 35,000-39,000 tonnes per year. About 16,100 tonnes of small pelagics, 2,000 tonnes of tuna and 18,400 tonnes of demersal with an estimated value of LYD 97million (US$ 80m) was produced in 2004 (FAO, 2008). Advisory Committee of the GFCM (2007) has shown that demersal fish resources would start to show signs of declines, with the exception of trawl fishing in the western part of Libya. (FAO, 2008), (see figure 4.3 on landings in the waters of Libya from other countries).

Scientific investigations conducted by the National Research Centre in 1993 indicate healthy demersal stocks along the central and eastern part of Libya's coast. Since this research and by far the lack of scientific evidence only portrays the lack of attention given to this sector and was instead, left in the artisanal sector and deep sea trawling for an unsustainable fishing (FAO, 2008). According to Sala (2004) unsustainable fishing accounts for the decline of many fish stocks and has contributed to dramatic ecological changes in the Mediterranean.

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[28] Maximum sustainable yield (MSY) is a term used in fishery management to describe the highest average catch (by weight) that does not reduce a stock's abundance over time, taking into account the stock's reproductive and growth capacities under prevailing environmental conditions. MSY is typically determined for a single species, thereby ignoring effects on or from other species. It is a level of fishing that, if approached, should signal caution rather than increased fishing,(Ocean Health Index,2014).

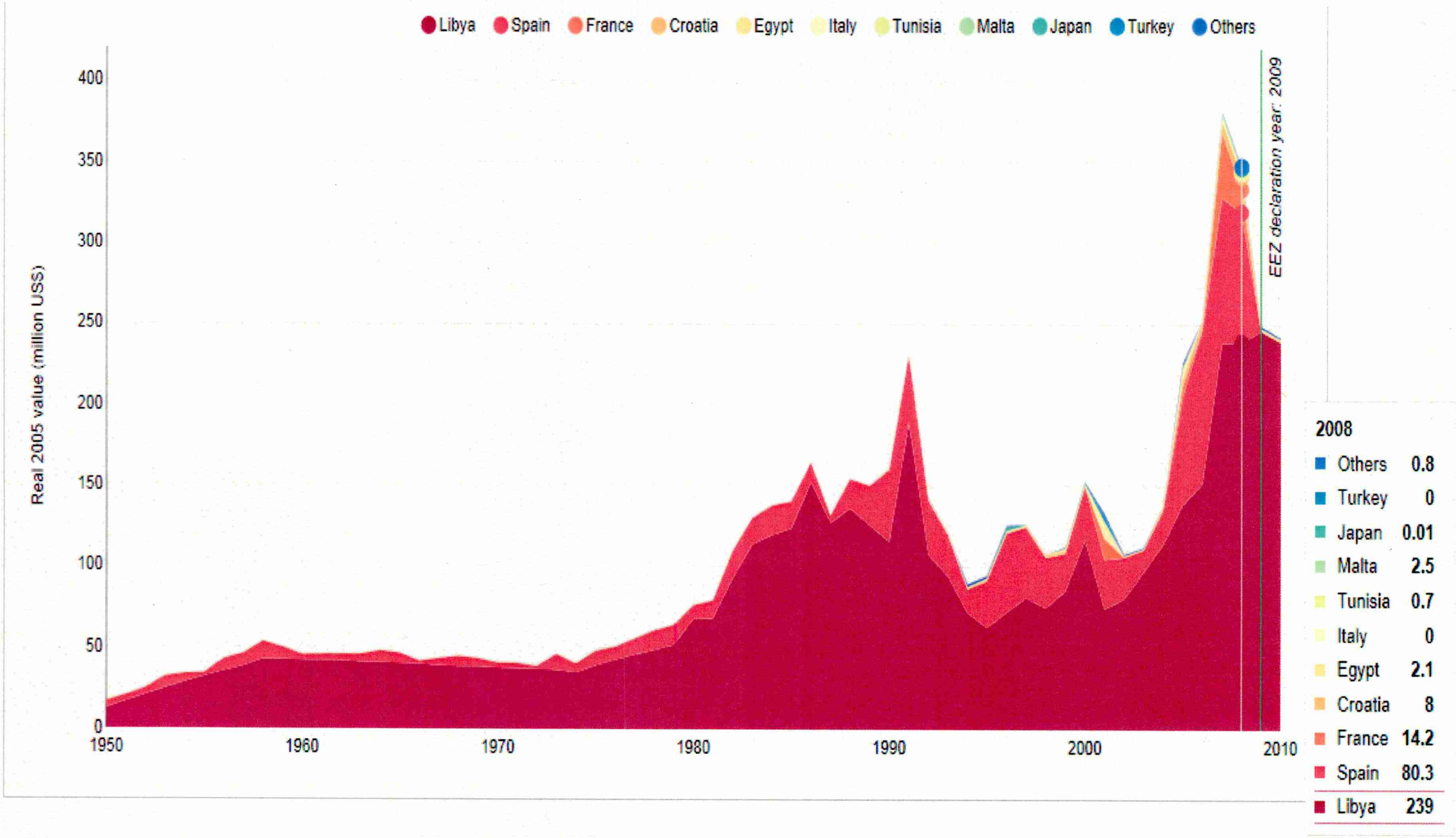


Figure 4.3: Landings by fishing country in the waters of Libya
Source: Sea around US Project (2011)

4.2 Fish Production in Libya Compared with Mediterranean Basin Countries

Table 3.17 in chapter three shows that, although there is an increase in the quantities of fish production during the period 1991-2011, it did not exceed 48,300 tonnes. Also, the general time trend of the production capacity of fish is increasing, but very slowly: about 0.229 thousand tonnes annually. Figure 4.4 shows fish production growth trend in the past two decades.

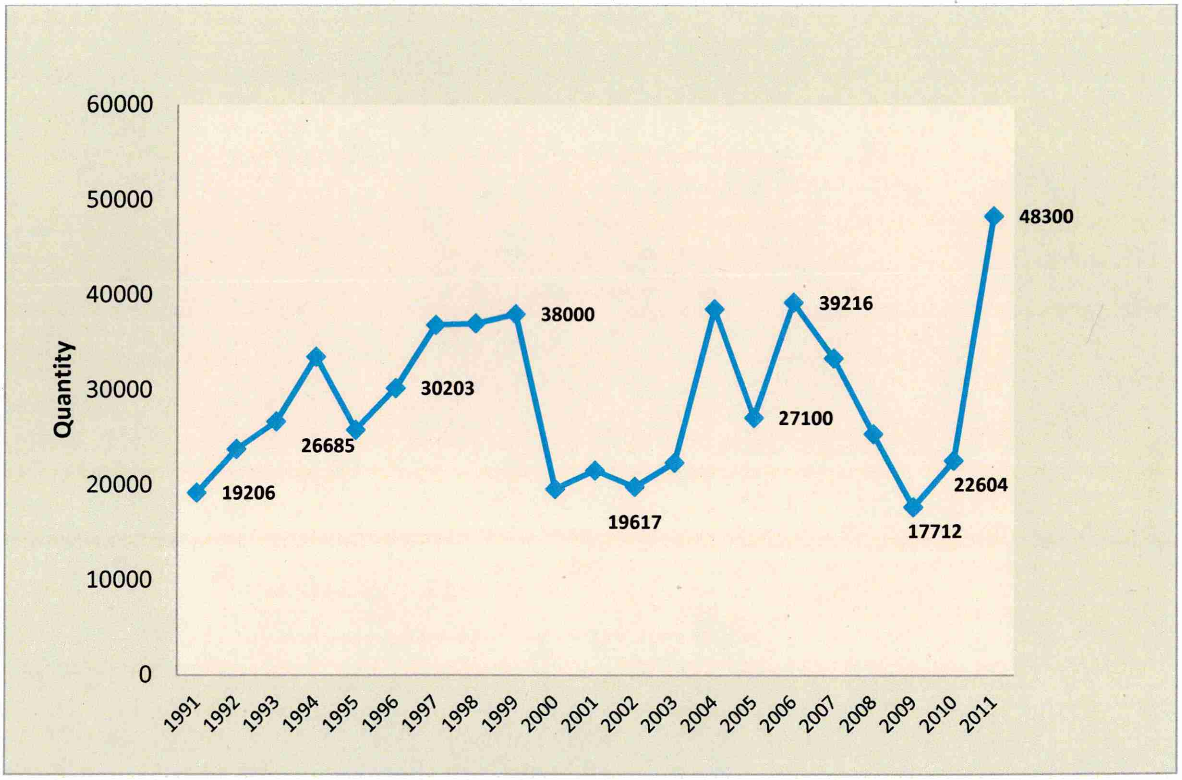


Figure 4.4: Fish production growth trend in the past two decades. Source: Unite Nation, Food and Agriculture organization, year book, different volumes; AOAD, Yearbook statistics, different years and National Foundation for Maritime Investment (2005).

However, figure 4.5 shows that almost half of the value ($123.6 million) of the fish harvested in Libyan waters is not accounted for.

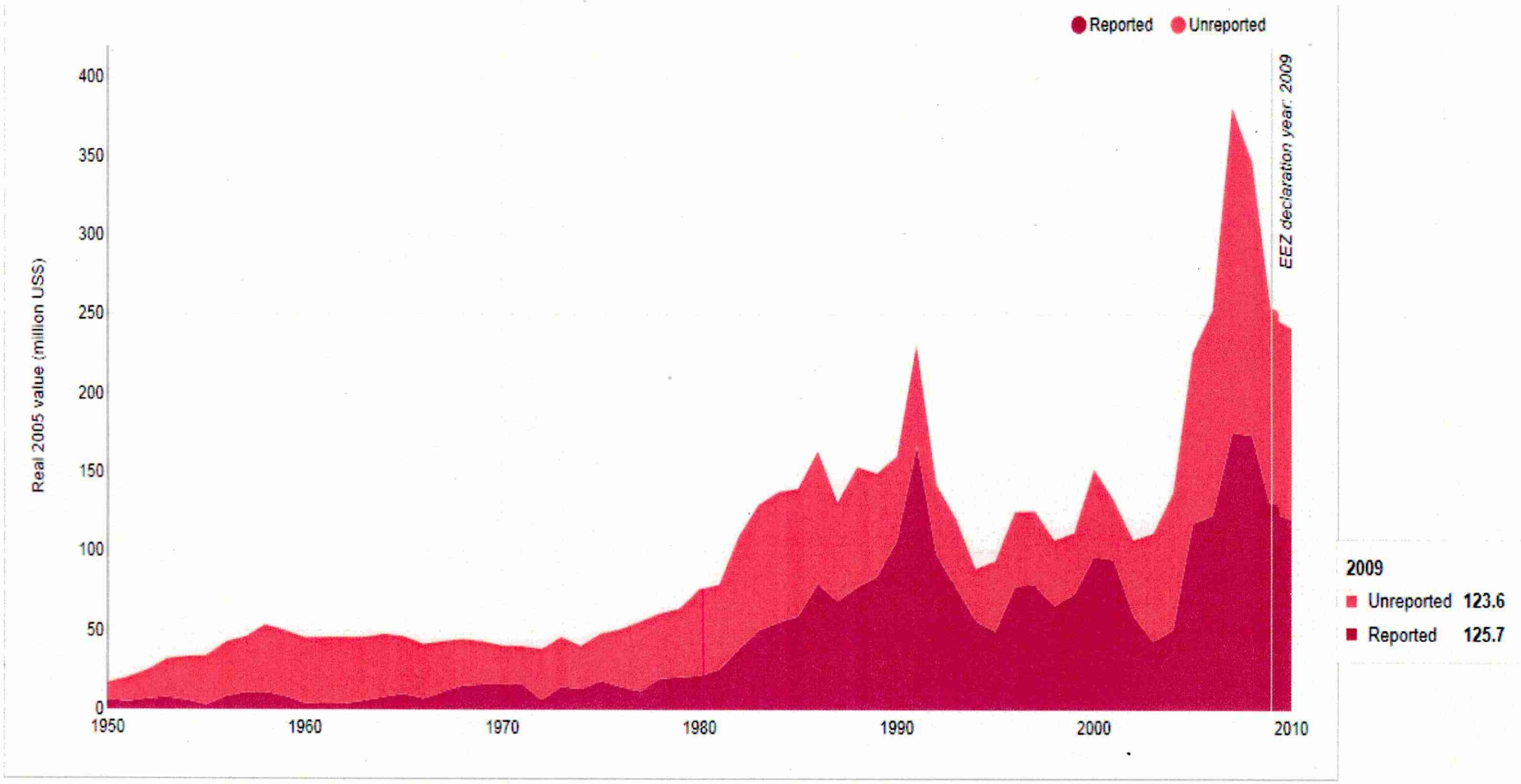


Figure 4.5: Catches by Reporting status in the waters of Libya

Source: Sea around US Project (2015)

The following section examines Libya's fish species, followed by equipment used in catching, distribution and marketing.

4.3 Libyan Fish Species

A number of studies have been conducted to ascertain the types and number of fish species in Libyan waters (such as, Aldebert and Pichot, 1973; Zupanovic and El-Buni, 1982; Lambouef and Reynolds 1994; Hassan and El-Silini, 1999; Lambouef, 2000). One of the most extensive studies aimed at documenting Libyan fish species was made by Rawag et al. (2003). Their study on the commercial species of fish in the Libyan coast, based six surveys from 108 different sampled stations identified the following: 34 crustaceans, 10 cephalopod and five sponge species. Penaeus kerathurus and P. longirostris are the two commercially important shrimp species that are predominantly western than eastern area. In all the sampled locations, Cephalopods are the common species recorded in eastern and western coast of Libya. While Rawag et al. (2003) study provide a reconnaissance survey on Libyan fish species, further detailed studies (e.g. using trawl survey data) to produce detailed data on Libyan demersal species is necessary for future planning. In addition, Haddoud (2004) cited in Alaerg (2007) identified and classified 250 fish species; 130 species of bottom neighbourhoods; 35 species of Mollusca (such as octopus, Sepia, squid), six types of crustaceans that are of high economic and nutrition value, along with Coelenterata and Echinoderm. Three types of commercial sponges were recorded as well as many types of interest rocky neighbourhoods in the food chain to the sea. There was also a study on the western Libyan coast that recorded fish species in the intertidal zone of six rocky-substrate stations. Benthic animals recorded in all the stations includes: 37 crustaceans - 6 (isopods), 23 (decapods), 7 (amphipods), 1(balanomorphs). The results, however, reveal noticeable difference between stations in the number of individuals sampled, which ranges between 374 and 4769 (Abushaala et al., 2014). Figure 4.6 shows the catches by commercial groups in the waters of Libya. The current study will provide new data about the commonest fish consumed in eastern region of Libya.

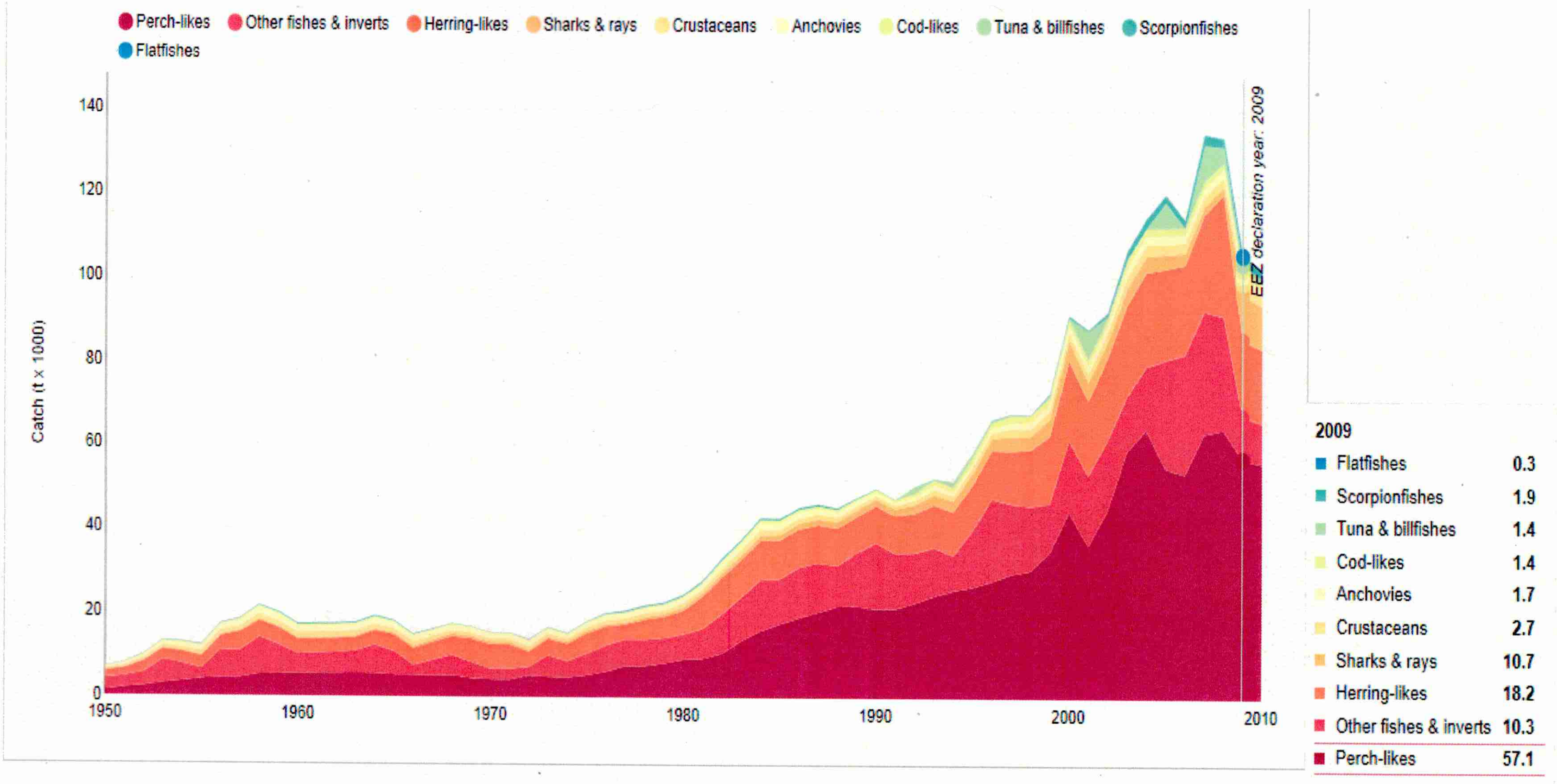


Figure 4.6: Catches by Commercial groups in the waters of Libya. Source: Sea around US Project (2011)

4.4 Fleets and gears of fishing in Libya

The evolution of the Libyan fishing fleet, according to a survey conducted in 2000 has ascertained the composition of the national fishing fleet as follows: 1,866 boats, 128 trawlers and 15 tuna vessels (FAO, 2008). More recently, the Marine Biology Research Centre have determined the number and type of boat, type and specifications of fishing gear used, and the number of hours of annual fishing in 2005/2006. The report recorded 1846 number of artisanal coastal fishing boats; however, the study team have missed sites with access difficulty and those with less than five boats in the eastern region. While Figure 4.7 shows the four types of boats in artisanal fishing (Flouka, Mator, Batah and Lampara), figure 4.8 shows the total number and percentage of types of artisanal fishing in Libya. Lampara and Batah are mainly found in the western region. Only two Batah boats were spotted in the Gulf of Bumba, eastern region (Marine Biology Research Centre, 2008).

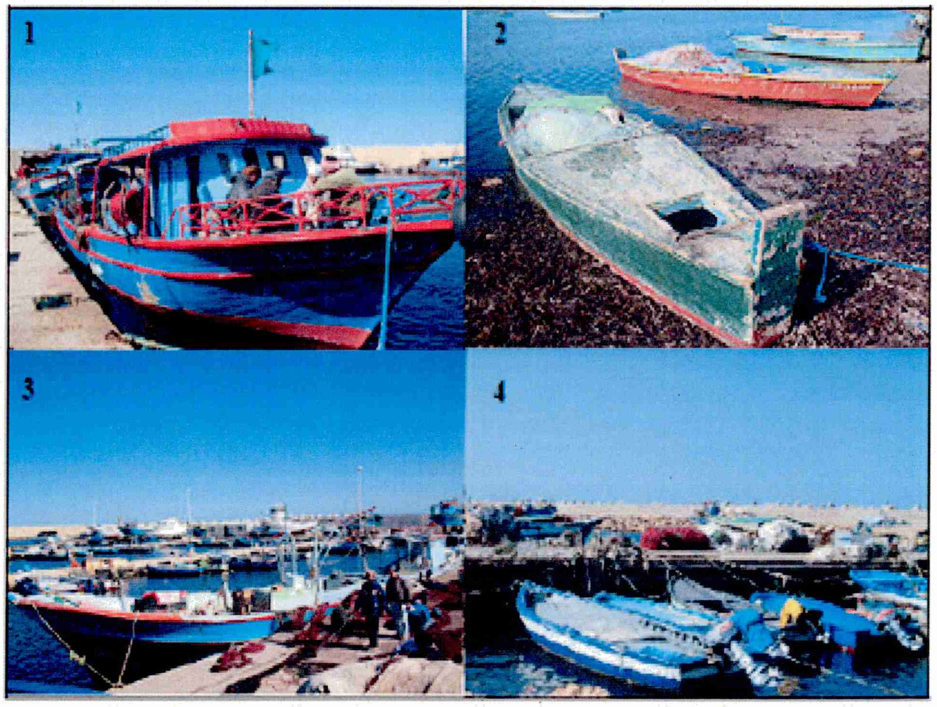


Figure 4.7: Fishing vessels in the Libyan coast: 1) Mator, 2) Floika, 3) Batah, 4) Lampara
Source: Marine Biology Research Centre (2008)

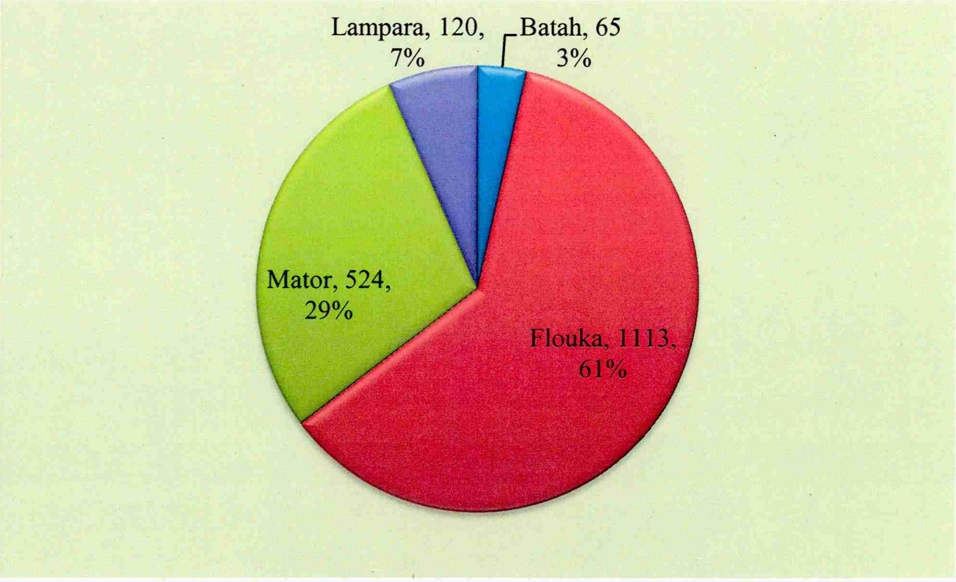


Figure 4.8 Total number and percentage of types of artisanal fishing in Libya
Source: Marine Biology Research Centre (2008)

The following table 4.1 shows in detail that a fishing gear is designed for a target species and usually involves the use of a type of boat.

Table 4.1: Types of artisanal fishing and semi- industrial boats in Libya

Group	Local Category	Engine power HP	Number of fishermen on the boat	Specifications and activity
One	Batah	12-25	1-4	7-8 m flat-bottomed boat used to fish gillnets and pots (octopus) in shallow lagoon waters; propelled by outboard engine for commuting then with a pole during work.
Two	Flouka	12-40 (For large flouka engines up to 55 HP have been recorded.)	1-4	**Gaïk:** double-ended boats of 4-6 m, derived from traditional craft that were propelled by oars, often now adapted for outboard engine propulsion; more common in the western part of the country. **Flouka:** small fishing craft of varied sizes ranging from 2 to 7 m; shapes are diverse but generally with a flat transom and no deck; powered by outboard engines.
Three	Lampara	20 -230	11-15	Usually 12-13 m with deck, inboard engine, a small roof and a purse seine winch; associated with one to three Dghaissas carrying kerosene or butane gas lights to catch small pelagic fish using light attraction at night; some units may convert to net and/or line fishing during the off-season; only present in the western part of Libya.
Four	Mator≤12	40- 120	5-9	Generally 7-12 m in length running between two types; used nets and hook has surface and an umbrella and basin to store fish and wheel to pull the net

Group	Local Category	Engine power HP	Number of fishermen on the boat	Specifications and activity
Five	Mator ≥ 12	230-120	7-12	12-18 m in length, used nets and hook has surface and an umbrella and basin to store fish and wheel to pull the net
Six	Jarafat < 24	300	9-12	12-24 m in length with wooden structure or railing, fishing cliff
Seven	Jarafat≥ 24	1000-300	11-16	7-12 m in length ; Iron structure, fishing cliff

Source: Lamboeuf .M (2000), Artisanal Fisheries in Libya Census of Fishing Vessels and Inventory of Artisanal Fishery Metiers; Marine Biology Research Centre Tajoura – Tripoli (2008)

4.5 Distribution of Fisheries Fleet according to Vessel Size (2009)

Figure 4.9 shows the various landing gears used in Libyan waters. Lamboeuf (2000) states that five most commonly used fishing gears represent 79% of the total use of fishing gear. They are the trammel net (halig) three longlines (bringali) with medium, large and small hooks (deshi, ghashin and rgig) and a 50 mm mesh size gillnet (mashruah).

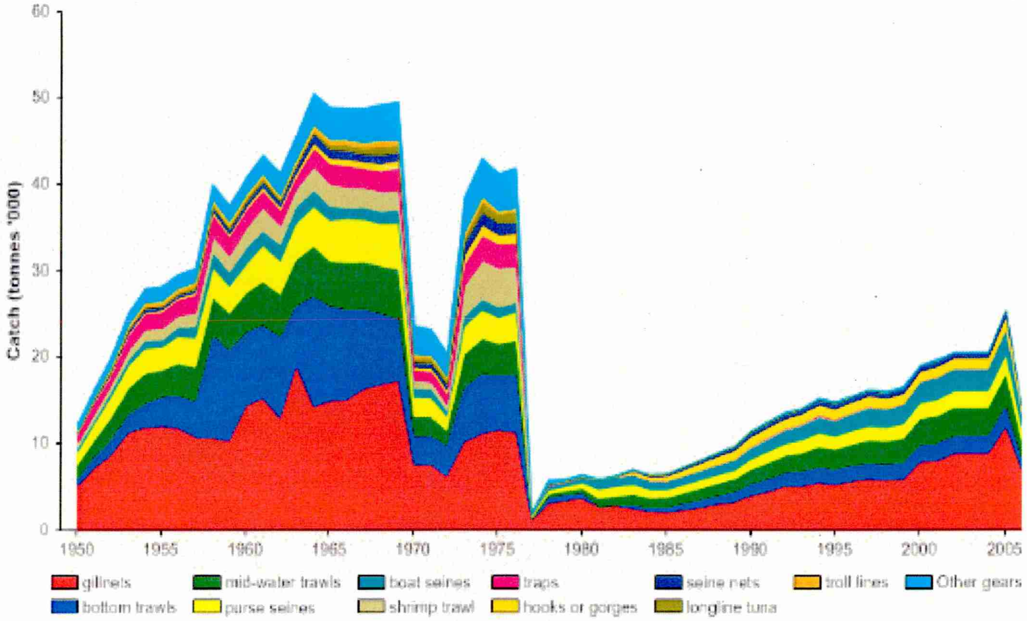


Figure 4.9: Landings by gear type in the waters of Libya
Source: Sea around US Project (2011)

According to the FAO (2008), Libyan government has introduced a set of by-laws towards standardising the supply and management of gear specification, mesh-size for nets and zoning for trawlers. For example, fishing law and technical regulations of the law allows using all types of gillnets of whatever length, however, the gillnets holes must not be less than 25 mm, and gillnets must not be installed and used for fishing at a distance of less than one nautical mile from the coast. The law stipulates the necessity to provide nets erected signs of yellow buoys for not less than 200 meters distance between them, so as to provide the parties with the knowledge of day and night lamp. But in reality, these measures are hardly enforced by regulators or even applied at all by practitioners due to poor sea and on-shore control and surveillance. Due to lack of enforcement of extant marine laws, it is common to find monofilament nets and undersized fish in landing sites. Furthermore, very damaging fishing activities such as the use of dynamite and cyanides to kill fish for easy collection on the surface was observed (FAO, 2008). Interviews with fish operators in eastern part of Libya during fieldwork have ascertained whether this pervasive fishing techniques banned by most countries is in practice.

4.6 Fish Trade in Libya

According to Reynolds et al. (1995) large urban markets serve as centres for marketing of the Libyan marine fish catch. However, a smaller fraction is channelled to canning plants to be processed for local market or as a fishmeal, during high peak production. The development of canning plants and growth in fish marketing was made possible since the privatisation policy of the fish marketing chain in the 1990s, where moderate progress has been made in receiving, handling and distribution of fish. Arguable, some marketing centres have access to ice plants and cold/chill storage facilities (Reynolds et al. 1995; FAO_1, 2005; Otman and Karlberg 2007). However, there is a dearth of studies on local fish marketing in Libya. Madana's (1995) market survey stands out among the very few. Madana's study assessed the following Libyan fish markets: fish markets in the city of Tripoli, the door of the sea market, wholesale market, Rasheed retail market and AL-dahra retail market section. The report assesses handling marine products and health conditions prevailing in these key markets covered by the survey. The report noted the lack of interest in the distribution channel including refrigeration and thermal control of fish stores, non-use of ice with fish offered for sale, and the lack of quality fresh fish because of the inadequacy of the cooling process. The poor availability of clean water in the stalls and shops selling fish has been identified as a major hindrance to selling quality fish. Further systemic problems within the sector has been identified during the fieldwork and documented in chapters eight and nine of this thesis. To ameliorate or eliminate the above problems, the study made a number of recommendations, including the urgent need to provide clean water to the markets and crushed ice needed to preserve the fish.

Al arifi's (2008) study about fish markets in the eastern region identified a plethora of problems similar to those found by Madana (1995). According to him, the eastern region markets simply lack the correct ingredients and marketing conditions: there is no single market that meets environmental health and safety standard of fish marketing. Other problem identified by Al arifi (2008) is that of pricing. The government allows fishermen, the opportunity to sell their products directly to the general public without obtaining any quality approval. The government also decided to set prices for fish at cheaper rates. These prices, according to Al arifi (2008) is far lower than real market prices. For example, fish first class (A) which comprises, for example, Epinephelus marginatus cost from 12-14 DL/kg but the real market price is around 25 DL/kg (Local Market Tripoli, the door of the sea, Libya, 2014 social media). The implication of this price fixing is that fishermen do not get the right price for their products and do not enjoy any subsidy.

Foreign fish trade has significant potential to develop local fishing industry. Fish is one of the most valuable agricultural commodities traded internationally with annual sales of nearly US$80 billion and increasing each year (FAO FishStat, 2006). For example, over one per cent of world landings come from Mediterranean fisheries and historically, the Pontic economy traditionally relied on commercial fishing and fish processing (Coll et al., 2010). Table 4.2 demonstrate fish exports in Libya during the period (1991-2011). The maximum amount of exports, approximately US$ 40.36 million, amounted to 6,410 tonnes in 2000. The general time trend of fish exports in the period (1991-2011) decreased and the annual decrease amounted about 0.178 tonnes. The general time trend of the total value of exports of fish increased with average of US$20.024 million. A review of the amount of fish imports (for the period 1991- 2011) showed that the amount of imports ranged between a maximum of 22.6 thousand tonnes in 2005 and a minimum of 2.9 tonnes in 1997 (see Table 4.2). The general time trend of fish imports in the period (1991-2011) increased, amounting to about 0.678 tonnes. Further, Table

4.2 demonstrate that the value of fish imports for the period (1991-2011) ranged between maximum 40.45 thousand tonnes by the year 2009 to 2011 and a minimum of 7.78 tonnes in 1997 . Studying the general direction of the total value of fish imports demonstrated that the amount of fish imports has grown by an annual increase of 1.061 thousand tonnes.

Table 4.2 the total volume and value of exports and imports of fish during the period (1990-2011) (Thousand Tonnes) US$ m

Year	Exports/ Tonnes	The value of export/	import/ Tonnes	The value of import /	BALANCE
1991	2.15	22.71	8.04	38.92	16.21
1992	2.15	23.10	7.61	29.33	6.23
1993	3	25.00	6.95	18.46	6.54
1994	5.50	31.26	3.99	10.31	20.95
1995	5.50	32.00	3.51	13.36	18.64
1996	5.55	31.17	4.23	12.17	19
1997	5.69	31.63	2.96	7.78	23.85
1998	5.73	32.87	3.00	11.38	21.49
1999	5.38	32.74	3.55	12.43	20.31
2000	6.41	40.36	4.49	9.10	31.26
2001	1.19	6.86	4.54	9.20	-2.34
2002	5.93	34.54	3.51	10.65	23.89
2003	5.96	35.37	3.54	11.84	23.53
2004	5.56	33.34	4.17	10.01	23.33
2005	3.63	2.93	22.6	28.47	-25.54
2006	0.78	0.77	15.6	36.66	-35.89
2007	0.78	0.77	17.7	36.66	-35.89
2008	0.78	0.77	15.63	36.66	-35.89
2009	0.78	0.77	15.63	40.45	-39.68
2010	0.78	0.77	15.63	40.45	-39.68
2011	0.78	0.77	15.63	40.45	-39.68
Average	3.543	20.024	8.690	22.130	

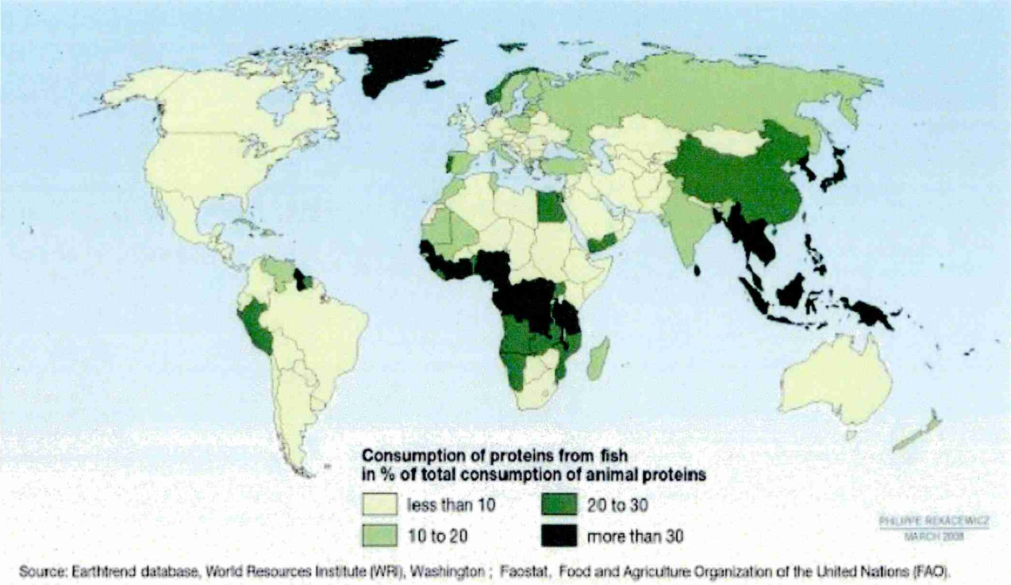
Source: United Nations, Food and Agriculture Organization-Yearbook of Fishery Statistics - Commodities - Rome - different volumes; Arab Agricultural Statistics Yearbook (AOAD), different volumes

Trade deficit increased for the study period (1991-2011), where the trade balance of fish at the end of the period amounted to 39.68 million dollars. It should be noted that some of the export figures from Arab countries like Libya should not be misinterpreted as a genuine surplus. There may be strong local demand for fish but some of these countries are plagued by problems of poor communications and transportation (Feidi, 1996), and those identified by Madana (1995) and Al arifi (2008) above. Both Madana (1995) and Al arifi (2008) have shown that local fish marketing is less developed and if it continues in this state, if would be difficult to meet international fish marketing standard. This study, as documented in chapters eight and nine, sheds light on the factors that affect the price as well as the circumstances surrounding the fish markets in eastern region of Libya. Measures that can be taken to revamp the entire fishing system and making it competitive both in domestic and international markets are offered in chapters eleven and twelve .

4.7 Fish Consumption

Fish consumption has been growing at more than 2.5% in both the developing and developed world (Peterson and Fronc, 2007). Global population growth, increasing development, income and standard of living, in combination of urbanisation and more efficient distribution channels are key drivers of strong increase in fish consumption (Delgado et al., 2003; Garcia and Rosenberg, 2010). For example, changes in increasing consumption of fish driven by urbanisation have added extra 5.7–9.3 kg per capita annual fish consumption (Delgado et al., 1997). As a result, direct human consumption of fresh fish increased from about 71% in the 1980s to more than 86% (136 million tonnes) in 2012. World per capita apparent fish consumption increased from an average of 9.9 kg in the 1960s to 19.2 kg in 2012 (FAO, 2014). As population is projected to reach 9 billion by 2050, average fish demand is likely to increase to secure food and nutrition for the growing population. As wealth increases in highly populated countries such as China and India, demand levels are likely to rise more strongly (Garcia and Rosenberg, 2010).

Per capita consumption of fish is fastest in areas of growing urbanisation, increasing income, wealth and development. While it is understandable that fish is traditionally the preferred delicacy in Asia, it also means that increasing standard of living and urbanisation has accounted for rapid increase in fish consumption (see, for example, Delgado et al., 1997). China is both an importer and exporter of fish apart from having the highest consumption rate. China is the third-largest fish-importer, accounts for 13% of world fish export valued atUS$17.1 billion in 2011 and US$18.2 billion in 2012 (Msangi, S., et al, 2013). Msangi, et al, (2013) estimate that China consumes 34% of global food fish supply and the consumption rate is projected to increase from 24.4 to 41 kg per person per year from the year 2000 to 2030. They also state that while consumption rate increases in emerging economies with growing wealth and urbanisation, there is far less consumption rate in Americas (North and South), part of North Africa and the Middle East. These global differences in fish consumption is as a result of many factors, including differences in cultures, beliefs, diet habits and purchasing powers of the populations and a lack of well-organised local marketing and distribution channels. Some of the peculiar factors strongly influencing consumption levels and those accounting for the less than 10kg / year fish consumption in Libya are reported in chapter nine. Figure 4.10 shows global per capita fish consumption.


Consumption of proteins from fish
in % of total consumption of animal proteins
less than 10
10 to 20
20 to 30
more than 30
PHILIPPE REKACEWICZ
MARCH 2008

Source: Earthtrend database, World Resources Institute (WRI), Washington ; Faostat, Food and Agriculture Organization of the United Nations (FAO).

Figure 4.10: Global per capita fish consumption.
Source: Pereltsvaig (2010) Global Geography of Meat (and Fish) Consumption.

According to the General Authority of Marine Wealth (2011), fish and sea food consumption has increased over the last decades in Libya from 1972 to 2010. European Commission (2009) recorded that nearly 95% of the total catches are for direct human consumption. Generally, Libyan fish infrastructure and local market channels remain weak, and even though the per capita consumption capacity of fish and sea food is growing, it did not exceed 7 kg/year from 2.6 kg in 1991 (Al-Huni, 1995; Khalfallah, 2015). In Egypt, per capita fish consumption stood at 16.6 kg in 2010 and in 2011 estimated 11kg/year in Tunisia 2011 and (Globefish, FAO, 2011, AL Wafd, 2015). During the last decades, Libya has pursued a policy orientated towards food self-sufficiency, increased national fleet and employment in the fishery sector. The fisheries sector in particular offers the benefits of: 1) serving as a source of income and livelihoods; 2) the efficiency of fish to produce proteins and 3) contribution of fish as food and its associated several health benefits to humans. If Libyans consume more fish because of these reasons, one would argue that it puts more strain on fish stocks. How current/future fishing practices can be sustainable has been analysed in chapters eight and eleven.

4.8 Comparison between Libya and some countries located on the Mediterranean Sea in terms of quantity of fish production.

The latest FAO fisheries statistics published in 2014 indicated that the Mediterranean and Black Sea produced a total of 1. 282. 090 tonnes of fish by capture fisheries in 2012 (table 4.3).

Table 4.3: Fish, crustaceans and molluscs production from the Mediterranean and Black Sea

Year	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
Tonnes	**1 618 336**	**1 686 127**	**1 488 815**	**1 475 448**	**1 433 391**	**1 436 743**	**1 282 090**

Source: Fishery and Aquaculture Statistics, different years, FAO, yearbook different years

Table 4.4 compares Libyan quantity of fish production with some countries located on the Mediterranean Sea. In terms of the size of Libya's Exclusive Economic Zone (EEZ) and Inshore Fishing Area (IFA)[29], Libya comes in the first place with 355,590 and 53,243km^2 respectively. However, the size of these areas (EEZ and IFA) are not a determinant of quantity in terms of fish production because the data in the table clearly shows that the Libyan fish production is lowest in quantity of fish produced with only 0.086 tonnes/km^2. This production figure is lower than in countries with smaller areas EEZ and IFA. For example, Algeria's EEZ is 128,842 km^2 is half of Libya's EEZ, but from 2005 to 2011, average fish production raised to 0.9 tonnes per km^2; that is 10 times more than Libya's current fish production. It should be noted that, like Libya, Algeria is also an OPEC member – it started oil production about the same time as Libya and the oil and gas sector accounts for 35% of the GDP and two-thirds of total exports (OPEC, 2013) – but has more robust fish production strategy. Similarly, Tunisia and Egypt are Libya's neighbouring countries with Mediterranean and EEZ of 102,062 and 169,122 km^2 respectively. However, the quantity of fresh fish produced from Egypt alone is 0.62 Tonnes/km^2; which is six times more than Libya's production level.

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[29] Inshore Fishing Area (IFA) concept as defined by Chuenpagdee et al. (2006), who defined IFA as: the area that extends from shore to either 50 km offshore or to the 200 m depth contour, whichever comes first.(Sea Around Us,2015)

France and Spain are European countries that have Mediterranean EEZ size of 64,547 and 132,767 km^2 respectively. Each of these countries EEZ is smaller than Libya's; however, their average fish production for the period (2005 to 2011) was 6.35 and 6.68 tonnes/km^2 respectively. If one is to look at and possibly compares the quantity of fish produced per km^2 of the Mediterranean coastline of each countries (see column 14 on table 4.4), Libya has the least production and efficiency with only 0.086 tonnes/km^2, followed by Egypt (0.62 tonnes) then Algeria (0.92 tonnes). Spain has the highest fish productivity by EEZ which measures 6.68 Tonnes/km^{2}followed by Italy with 6.45 Tonnes/km^2. This also means that Libya's EEZ has the capacity to provide a stock of factors (fish), but that has not been fully developed as in the case of the above countries mentioned. As Porter (1998) argued, factor conditions, particularly natural capital or endowment, which in this case is the fish, are created and upgraded to make it competitive, rather than relied upon as an inherited factor. Subsequent chapters of this thesis (6-11) shows that a number of factors including political, technological and socio-cultural factors, for instance, account for the low fish production quantity and growth has hardly been built on this inherited factor.

Table 4.4 contains the volume of fish catches landed by country or territory of capture, 2005 -2011

	Year	***Mediterranean coastline length***	**EEZ area km^2**	**Inshore Fishing Area (IFA) km^2**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2005-2011**	**Fish Production Tonnes/ EEZ area km^2**	**Fish Producti Tonnes Inshore Fishing A (IFA) km**
1	**Libya**	1970	355,590	53,243	27100	39216	33352	25400	17712	22604	48300	30526	0.086	0.57
2	**Algeria**	998	128,842	10,463	121558	142 066	143155	135041	123640	90639	98251	118714	0.92	11.35
3	**Egypt**	955	169,122	28,872	94705	105718	113611	112870	105253	98834	99764	104394	0.62	3.62
4	**Tunisia**	1200	102,062	44,653	90940	95388	89065	87921	89389	87599	93945	90608	0.89	2.03
5	**France**	1703	64,547	12,377	483201	480460	424519	386782	355609	355836	381807	409745	6.35	33.11
6	**Italy**	7468	315,972	72,000	218234	236259	205068	163273	182188	167616	154428	189581	0.60	2.63
7	**Spain**	1670	132,767	28,649	814847	918458	779446	889606	895143	937746	969492	886391	6.68	30.94
8	**Turkey**	2200	72,200	11,620	380381	488966	589129	453115	425046	445680	477658	465711	6.45	40.08
9	**Morocco**	512	18,302	4,347	45 622	50 524	42 138	35 754	40 581	33 916	26 635	39310	2.15	9.04
	Total of fish Quantity				**2466005**	**2540372**	**2333120**	**2452854**	**2523225**	**2373364**	**2440082**			

Source: General Fisheries Commission for the Mediterranean, GFCM data reporting requirements, Different year; Sea around Us (2015).

Next section discusses comparison between Sultanate of Oman and Libya as Oman is a rich oil country and has developed in its fishery sector.

4.9 Sultanate of Oman: Fisheries Development and Economic Significance

Sultanate of Oman is the non-OPEC largest producer of oil and natural gas in the Middle East. Sultanate of Oman has some comparative advantages of location similar to Libya: with a coastal length of 3165.00, Shelf area of about 58 000 km^2, the country is located on the Arabian Peninsula; it has very close proximity to the Arabian Sea and Persian Gulf; and is accessible to one of the most important oil and natural gas corridors in the world US energy information Administration, 2014. Because of the abundance of oil and gas resources, the country naturally relies on these resources to power the economy – making Oman an oil-dependent economy – where oil accounts for more than half of the country's GDP (*ibid*). Just as the Mediterranean Sea provides potentials for fishing in Libya, so also the Arabian Sea and the Gulf provides sources for fish production. Unlike Libya, the fishery sector in Oman is fairly developed and is one of the most important industry contributing to the gross domestic product, food security and provision of employment opportunities (Hashim et al., 2011). It is because of this importance that Omani government policy on fisheries undertook a number of reforms of this sector through improvement in the value chain (for example, catch, preservation and marketing). For example, artisanal fisheries represents the mainstay of fisheries production, contribute 95% of recorded landings and 80% of fish catch, while the remaining 20% is being exploited at industrial (commercial, coastal) scale (Oman Arab Bank, 2013; Rashdi and Mclean, 2014). For the artisanal fisheries to continue to provide the economic foundation for most people there was the need to further develop the industry in accordance with modern demand sophistication and for a long-term economic viability.

To make this possible, over the last 10 years, improvements were made through government subsidy programmes and development funds made available for the procurement of modern fishing equipment such as: boats, fishing gear and equipment, depth finders, fish finders, communication systems, winches, longlines, traps, fish handling gear and fish preservation boxes. Further physical development of the industry was made by the government through the construction of ports, roads, radio communication network, and workshops, ice plants among others (FAO, 2001).

According to the Ministry of Agriculture and Fisheries Wealth (2011): "One of the newest branches of Oman's economic diversification drive returns to the Sultanate's roots: expansion of the fisheries sector. Ministry of Agriculture and Fisheries Wealth (MAFW) is committed to building a world-class fish farming sector that will take advantage of Oman's natural aquatic resources and develop these resources to their potential". Capital intensive large-scale fisheries are encouraged to catch resources located far from the coast and in high seas. To this end, Oman has developed an industrial scale fishery based initially on foreign fishing agreement and private partnerships with foreign companies (*ibid*). This is how Omani government has been using revenue from excess crude account to develop the under-developed state of fish production, processing, distribution and marketing structure that has undermined the growth of fisheries. As indicated in Figure 4.11, investments in this sector have yielded positive growth - there has been an increase in total fish production, quantity landed and revenue generation. The export market (as shown in figure 4.12) is also rising as the finished products are produced to meet international market standard, notwithstanding the steady rise in domestic supply.

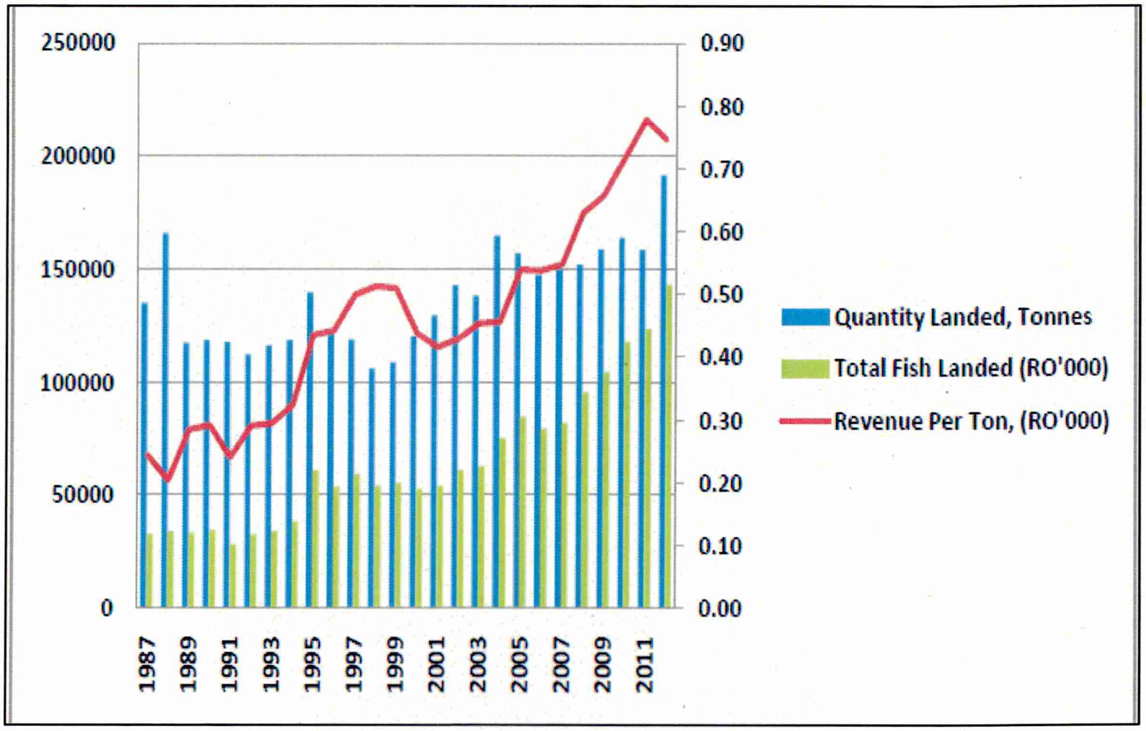

Figure 4.11: Fish landed value, quantity and trend of revenue per tome (1987-2012)
Source: Holland pioneers in international business (2014) Aquaculture & Fisheries Development in Oman

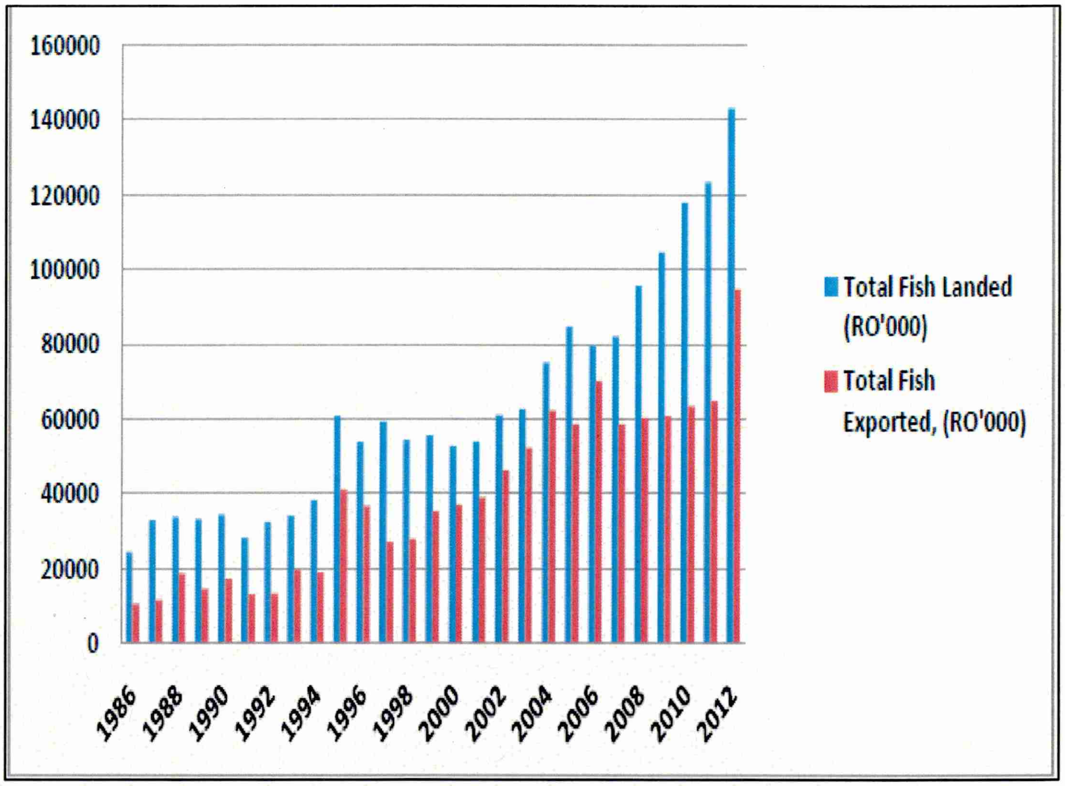

Figure 4.12: Value of fish landed and exported
Source: Data from Oman Arab Bank (2013) Investment Thesis, Oman Fisheries

It is widely known that Oman is by far the major fish producer in the Gulf region – exporting dried sardines, in particular, to neighbouring countries since antiquity (Morgan, 2004). This was made possible through artisanal fishing of tuna, sardine, large jacks, mackerel, sailfish, barracuda, snappers, groupers, sea breams, sharks, rays, shrimp, lobster, cuttlefish and abalone. This traditional form of fisheries not only dominates fisheries, it is important in the cultural life of many villages as it is the main employer of many rural coastal regions. With the recent attention given to the sector by the government, it is making significant contribution directly to the Omani economy in terms of measurable cash flow. Fisheries sector contributes at least 54% to agricultural GDP each year and has been undergoing further economic development (Young, 2006). According to government estimates around 36,000 people are employed in fisheries related occupations, of which over two thirds are fishermen, (Ministry of Agriculture and Fisheries, Oman, 2013). Table 4.5 provides data on Oman's fisheries.

Table 4.5: Oman fish landings, imports, exports and apparent consumption, 2008-2012 (in tonnes, except percentages)

	2008	2009	2010	2011	2012
Total fish landings	151,910	158,553	163,926	158,722	191,728
Total fish imports	14,362	15,202	11,978	16,575	16,836
Total fish exports	74,202	80,975	86,933	93,928	117,083
Apparent domestic consumption (landings + imports- exports)	92,070	92,780	88,971	81,369	91,481
Net trade (exports- imports)	59,840	65,773	74,955	77,353	100,247
Percentage of total landings exported (%)	49%	51%	53%	59%	61%

Source: Ministry of Agriculture and Fisheries Wealth (2015) Investment Guidelines for Aqua Culture Development in the Sultanate of Oman.

Sardine, Indian mackerel, emperor, ribbonfish and grouper top export volume and sardines, emperor, Indian mackerel, sea bream and cuttlefish top export volume in 2012 (Ministry of Agriculture and Fisheries Wealth, 2015). These fish catch provided employment opportunities to over 45.200 people in 2013, (*ibid*). Rashdi and Mclean (2014) estimated that more than one quarter of Oman's population depend on fisheries as a source of living and for food. For instance, the FAO (2010) estimated that the highest per capita consumption of fish in the Middle East is in Oman with 28 kg/year. In 2013, Omani government planned an investment of US$ 1.3 billion in fisheries infrastructure development and sustainable fishing to increase fisheries production in the country. In response to the growth in fish demand, the declining wild fisheries stocks and its effect on the livelihood of fishermen, farmed fish (aquaculture) production has increased (Chalil, 2012). As stated earlier, artisanal fisheries have been assisted through substantial expenditure on infrastructure, direct grants, subsidies, free provision of fishing gear, training and subsidised services such as engine and vessel upgrade and repairs (Morgan, 2004). Apart from funding infrastructure that can support fisheries competitiveness, other supporting areas of fisheries such as, research institute, statistics collection system and a monitoring, control and surveillance capability, were established. Figure 4.13 is an example of the upgrade in the facilities (boats) used by small-scale or artisanal fishers. However, Young (2006) stressed that stock assessment of major commercial fish reserves, management upgrade, control and surveillance need to be strengthened.

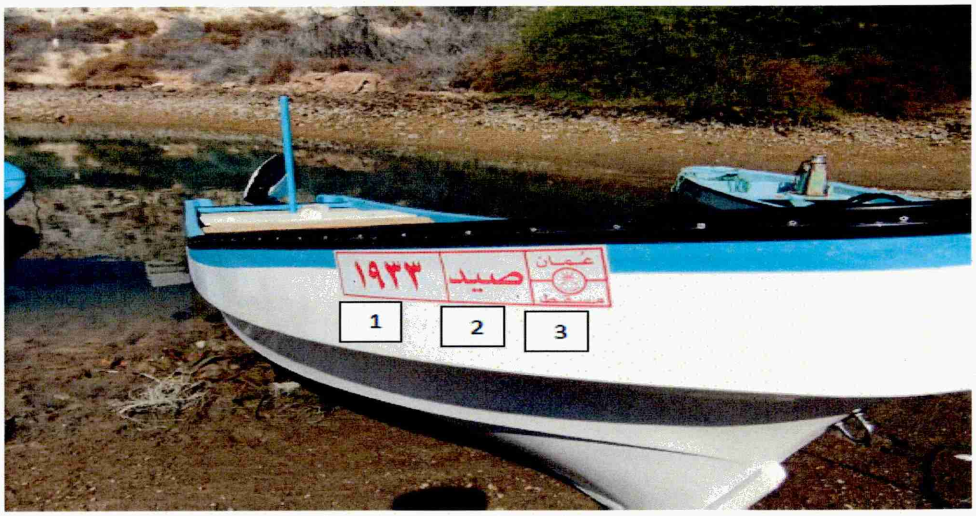

Figure 4.13 Numbering for artisanal boats; (1) Boat license number
(2) Arabic word indicates it's a fishing boat (3) Governorate name (lower part)

Unlike Oman that has taken significant and important steps in addressing fisheries physical and management policy issue, Libya is one of the countries that, in the first instance, do not have sufficient information about fishery (Sumaila and Pauly, 2006). Secondly, the policy for fisheries management and marine ecosystems preservation is either weak or obsolete. For instance, the FAO (2008) considered the fisheries legislation Law Number 14 of 1989 as obsolete because it is not in line with current trend of fisheries development and management. This means Libya needs to develop fishery policy that reflects the major international fishing convention. Thirdly, fisheries surveillance is extremely weak in Libya, both at sea and on-shore, and such, limits the capacity of key institutions to manage the sector. There is overlapping of responsibilities in the discharge of management and surveillance between GMWA and its Protection and Maritime Office. Fourthly, fisheries have not been integrated into the economy to create jobs and food security for a healthy nation. Fifthly is the absence of a framework for sustainable aquaculture. In this regard, Aboarouch's (2013) study illustrate that marine fish farm is a significant employer, particularly in rural areas where it makes a considerable contribution to rural economies, however, in Libya the sector is not developed and the current performance is inefficient. Low efficiency, productivity and growth characterise aquaculture in the country. As stated in chapter three surplus oil revenues has played an unhelpful role in the underdevelopment of fisheries sector. Instead of using oil revenue to develop this sector, as is the case in Oman, in Libyan situation, a wide gap exists between development programs announced by the government and the actual implementation of the programme. Chapter eleven is an extensive analysis on how Libya can transform its fisheries potential to contribute to the wider economy, as much as it does in Oman.

4.8 Summary

This chapter has shown that Libyan fisheries should have been a bigger contributor to the economy because of its enormous potential, whereas countries with smaller potentials based on their coastline length have found more productive use of their fishing resources. Examples of these countries drawn were Egypt, Morocco, Algeria and Tunisia. Other European countries such as Spain and Italy have a well-developed fisheries industry and the rate of consumption is far higher than Libya's. A specific attention was paid to Oman where fisheries is fairly developed and is one of the most important industries contributing to the food security and provision of employment opportunities. Omani government has made far-reaching interventions in supporting artisanal fishers and the fish value-chain. In other words, even though Oman is heavily dependent on its oil, it has also been able to give sufficient support and protection measures, and integrated fishing into the main economy to allow the gradual growth.

Libya suffers from food security issues and from the information made available in this chapter, enhancing the sector would avert any shortage in animal protein, supports food security measures and economic diversification drive - reduces imports, creates employment and develops fishing communities along the coast and enhances the multiplier effects of the fish supply value-chain. However, for these benefits to be achieved in Libyan context, considerable improvements have to be made and implemented by high-quality management structure. There are various challenges that have to be addressed in order to grow and develop fisheries from the short-to-long term. These challenges are being understood based on PDM as it provides the basis for understanding the physical, environmental and managerial issues that limits the development of fisheries in Libya as in other neighbouring countries of North Africa and Europe., the next chapter (5) is analysing competitive advantage and Porter's diamond model in relation to Libya's fisheries sector.

Chapter Five

Analysing Competitive Advantage and Porter's Diamond Model in Relation to Libya's Fisheries Sector

5.0 Introduction

Chapter Two has established that the resource curse phenomenon afflicting Libya has prevented the growth of other non-oil sectors of the economy. It has also shown why a large oil resource with corresponding wealth is not sufficient to develop industrial strength. Chapter Three has argued that long-term solution for avoiding the resource curse in Libya is a greater diversification of the economy by paying greater attention in areas of competitiveness, such as fishing. For that to be achieved, a model that has been proven and tested to work in resource-rich developing countries needs to be adopted. One such robust model for understanding the competitiveness[30] of a nation and on what sector to promote is known as the diamond model of competitiveness developed by Porter (1985). This model scrutinises the determinants and interactions required to develop and sustain the competitive advantage of an industry, in this case, one that could be used for diversifying the Libyan economy. This chapter, therefore, focuses on the international competitiveness of countries with an extensive review of Porter's Diamond Model (PDM) of competitive advantage. The diamond model describes the key variables and interactions required to develop and sustain a competitive industrial cluster. This theoretical model (PDM) is applied to Libyan fisheries to examine the potential competitive advantage of this sector as outlined in chapters eight, nine and ten.

This chapter is structured as follows. The first section (5.1) gives an overview of some trade theories and growth. In this section, theories such as Adam Smith's theory of absolute advantage, the staple theory of export-led growth and competitive theory are briefly discussed. The aim of the review of theories of competitive advantage is to provide background for the discussion of PDM (1985). The second section (5.2) examines PDM (1998) within the context of the competitive theory. This model is a conversational description of the different competitive theories based on logical reasoning instead of using complex mathematical models (Smit, 2010), thus making it easier for policy-makers to understand and utilise in enhancing their country's competitiveness. The section draws on some examples of the contribution of PDM as a theory of international competitiveness of countries. The third section (5.3) concentrates on the factors that determine general food consumption, with a view to understanding fish consumption behaviour in order to meet the demand conditions of PDM. The breadth of the discussions are informed by the fact that the goal of this chapter is to reconsider the theories as a backdrop to discuss the Porter diamond model, which explains the competitive advantage of countries not to provide a detailed exposition of the different trade theories.

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[30] The only meaningful concept of competitiveness at the national level is productivity. (Porter ,2008)

5.1 Trade Theories and Economic Growth

It is widely acknowledged that the economic growth of countries depends on capital accumulation (both physical and human), income distribution, price fluctuations, trade, political conditions and geographical attributes (Medina-Smith, 2001). As a result, for over two centuries a number of theories have been established to link trade and economic growth. For example, the mercantilist idea (dominant in Europe from the 16th to the 18th century) was that for a country to be wealthy and politically strong, it must have more exports and fewer imports of restricted materials (LaHaye, 2008). Adam Smith argued that nations cannot be rich simultaneously under mercantilism; however, nations would simultaneously gain from each other if there is free trade based on their specialised absolute advantage. Mercantilist approach was eventually substituted with the free trade and Smith's laissez-faire economics from the eighteenth to nineteenth century Britain, which de-emphasised the importance of gold and silver as a primary determinant to growth (Magnusson, 2003). The mercantilist philosophy makes crude case for government involvement in promoting exports and limiting import (Ahmad, 2013).

The initial attempt to explain why countries should trade to grow can be traced to the 1776 classical school of economic thought that started with Adam Smith's theory of absolute advantage in the context of export-import trade (Krugman and Obstfeld, 2003). The theory of absolute advantage elucidates that countries can improve the income and standard of living of their citizens by producing and selling more number of goods or services than their competitors. Accordingly, a country's prosperity lies in its ability to produce goods and services which have an absolute cost advantage over other countries and to import those goods and services in which it has an absolute cost disadvantage (Smit, 2010) . Adam Smith (1776) promoted unrestricted free trade (Ahmad, 2013).

According to Cho and Moon, (2013), Smith's idea emphasised that government intervention such as granting monopolies, restricting imports, subsidizing exports and regulating wages would inhibit the natural growth of economic activity; therefore the role of the government should be minimal. Smith calls for specialisation by regions and countries which makes the country powerful economically, rather than focusing solely on national self-sufficiency alone (Cho and Moon, 2013).

The most vital economic policy of government was to focus on eliminating monopolies and maintaining competition, nonetheless, Smith's position on government regulation was however, not unlimited: Smith conceded that vital activities like education that were too extensive for private undertaking ought to be undertaken by authorities. He additionally accepted that the Navigation Acts, obliging the utilisation of English vessels to transport products to and from England, were important to shield the maritime sector and as an issue of national protection. According to Cho and Moon (2013), Smith was of the opinion that the benefit of adherence to the 'natural law' came from the division of labour. In addition, competition was a significant part of the society that Smith proposed as was Rivalry which was imperative. He posited that Rivalry guarantee that every country would do what they were best fitted to do, and it guaranteed full remuneration (Cho and Moon, 2013). Further, Smith held the view that a system of justice was critical to the advancement of commerce and prosperity. This view is captured in his assertion that '...commerce and manufactures, in short can seldom flourish in any state which there is not a certain degree of confidence in the justice of government" (Lipford and Slice, 2007: 910).

In resonance with Smith's position many recent writers have also emphasised the necessity of secure private property rights, contract enforcement, the rule of law and what is generally labelled economic freedom as an indispensable requirement for commerce and prosperity (Bethell, 1998; Hoskins and Eiras, 2002). In summary, Smith's persuasion was that government was to pay very clear and distinct roles in the economic activity of the country largely focusing on: provision of protection from external aggression, provision of internal order, and provision of public goods like basic education for the populace (Lipford and Slice 2007).

David Ricardo extended and made important contributions to the theory of absolute advantage. He developed the comparative advantage theory-published in his book; '*On the Principles of Political Economy and Taxation',* (1817). The theory argued for the relative opportunity of countries and is based on investigation that focused on England and Portugal as case studies. A departure from Adam Smith's ideology, David's comparative advantage theory is hinged on countries resources and technology and their ability to produce these resources at a lower opportunity cost. According to Krugman and Obstfeld (2003), this theory of comparative advantage advocated that countries concentrate on producing those goods and services that have better advantages (lower marginal and opportunity cost) than other countries and trading those goods for others. This means: "despite absolute cost disadvantages in the production of goods and services, a country can still export those goods and services in which its absolute disadvantages are the smallest and import products with the largest absolute disadvantage" (Smith, 2010: 109). The key postulate of the theory was that countries stand to gain through the advantage of trade with each other even if one of them has absolute advantage of producing some goods. Evidences from research and empirical studies have however shown that conditions that maximise comparative advantage often lead to trade deficits rather than surplus. Specifically, some empirical literature clearly contradicts trade gains between developing countries and industrialised economies, with the former falling on trade deficit (see, for example, Medina-Smith, 2001:6-9, for various examples). Notably, Ricardo, in similar manner to Smith affirms that the role of the government in trade should be minimal. Shanmugapriya (2005) warns that comparative advantage theory has many shortfalls; key amongst them is focus on maximisation of production and consumption, and its foundational basis is limited to considering the production of two sets of goods by two countries. Further, Ricardo argues that the theory does not take into account the aspect of learning by doing. Almost a century later, Heckscher and Olin (1919-1933) developed the factor proportions trade theory, which postulate that countries–produce and export goods that intensively use factor endowments that are locally abundant; thereby suggesting that patterns of trade are determined by difference in factor endowments - not *productivity* (Yamazawa, 1969).—It can be argued from Smith and Ricardo's proposition that the best accomplishments of the Libyan governments will be to minimise their economic roles in promoting the economy and development of the country. Whilst the role of government is reduced, liberalising domestic and foreign markets for both factors and products should be pursued to promote the spread of markets and the rule of market incentives would consequently revitalise the efficiency of the economy.

Since the late 1960s, studies have been conducted to examine the role of export performance in the economic growth process (Medina-Smith, 2001). One of such theories that do not focus on the export itself, but rather, on the impact of the export on the rest of the economy is the theory of competitive advantage. Another example of these theories that is relevant to this thesis and one which can be situated with Libya as a resource-rich nation is the staple theory and export-led growth.

5.1.1 Staple Theory and Export-Led Growth

The staple theory of economic growth and development was first designed to reduce overdependence and promote diversification. It was pioneered by Canadian economist W.A Mackintosh (1923) and economic historian Harold Innis (1930). They provided an explanation of how the pattern of settlement and economic development of Canada depended essentially on a rich endowment of natural resources for which there was demand from Europe and United States. Altman (2003: 230) states that:

> The staple theory is a subset of the export-led growth hypothesis, designed to explain the growth and economic development of resource-rich economies, it is a theory that has been misunderstood and is seen to be at odds with the stylised facts of economic growth and development.

The essence of staple theory is increasing exploitation of natural resources, which may involve additional inputs of these resources and technological change to allow more intensive utilisation of them, and often both. In any case, discovery of either new resources or new processes is a prerequisite for growth, and discovery is, by its very nature, a discontinuous process (Roemer, 1970). This theory does not focus on the export itself, but rather, on the impact of the staple production on the rest of the economy. The export process may need equipment and materials manufactured to help produce within the economy, thus continuing the export process which could stimulate investment in other industries. Wellstead (2007) argued that since the dawn of the twentieth century, Canada has focused on the exploitation of natural resources and the Canadian government has sought to facilitate growth and expansion and stressed the importance of innovation in the development of industries and replacing new goods food.

An alternative to import substitution strategy and export-led growth strategy emerged in the 1970s, where many developing countries adopted it as a growth strategy (Palley, 2003). Giles and Williams (2000) export-led growth (ELG) model has been a subject of considerable attention in the development and growth literature (e.g. Keesing, 1967;

Meier, 1984; Krueger, 1985). The debate broadly centred on whether a country is better off promoting export trade policies or import substitution. Neoclassical school of economy proponents led the hypothesis of promotion of exports to increase and stimulate economic growth (Billah Dar et al., 2013). In addition, many economists (e.g. Emery, 1967; Jung and Marshall, 1985; Ram, 1985) believe that export is a tool that promotes growth by encouraging savings and stimulating demand because exports increase the potential supply in the economy by raising the ability to import. Moreover, this strategy brings technological progress and learning.

The 'Asian Tigers' or 'Asian newly industrialising countries' (NICs) - Hong Kong, Korea, Singapore, Taiwan, Malaysia and Thailand - are the best examples of countries that have adopted the export-led growth (ELG) model and have achieved stunning success. According to Giles and Williams (2000), these countries have since the 1970s doubled their standards of living every 10 years. Apart from the NICs, China's remarkable success since adopting the ELG model in the 1980s-1990s only affirms the argument that "openness to trade is a mechanism for achieving more rapid and efficient growth and better distribution of domestic resources" (Findlay and Watson, 1996: 4). There are many theoretical and empirical studies (e.g Marin, 1992; Serletis, 1992; Dhanajayan and Devi, 1997; Shan and Sun 1998; Oxley 1993; Awokuse, 2003) which used different tests (e.g. simple correlation between economic growth and export, using the ordinary least squares or causal relationship between economic performance and exports) and some results indicate positive correlation between export and output, and identify trade policy as the critical element of economic growth. Giles and Williams (2000) believe that it is difficult to decide for or against ELG as the whole issue has become an empirical question, based on their review of 150 ELG papers. Based on some positive outcomes, the US Agency for International Development (USAID) and the International Monetary Fund (IMF) supported World Bank (1993) have all recommended ELG as a model for development.

It is clear that the success achieved by the Asian Tigers, most of whom have limited resource wealth, is in sharp contrast to those of natural resource abundant economies, in particular oil exporting countries like Libya and Nigeria. These countries tended to have diminished incentives for industrial growth and small contributions from export growth in agriculture, manufacturing, technology and services (Auty, 2002). As a result of high price levels from one dominant sector, which is oil and gas or minerals, ELG has not been pursued. For example, Sachs and Warner (2001: 835) categorically stated that these countries "lack of active promotion of exports renders the export sectors uncompetitive". To support this assertion, it has been shown in chapter two that Libya tended to be a high-price economy and that, partly as a consequence, it missed out on promoting export-led growth, except for the direct contribution of the oil sector itself. Unlike Asian Tigers that have aggressively promoted both domestic demand and export-led commodities, poor export policies have constrained non-oil exports, in particular surplus fish that have exceeded local demand (see chapter four).

While appreciating the different strengths of the foregoing theories, Cho and Moon (2013) portend that the present international trade is too complex to be understood using any of the above discussed theories. While upholding the value of the theories in understanding different aspects of existing industrial and trade policies, they argued that none of the theories allowed for simultaneous consideration of the different important variables that characterise the present global economy. In their thought, Michael Porter's diamond is an important development in addressing the gap. Michael Porter's new competitiveness theory explains that nations are most likely to succeed in industries or industry segments where the national, diamond, is the most favourable (Cho and Moon, 2013). As a result of the situation of Libya – one suffering from the resource curse which resulted to lack of productive industries or sectors, in addition to food security problems – this thesis first argue for making fish industry more competitive domestically before considering export market. Instead of adopting the ELG model on fisheries and using the revenue to attain food security, the competitive advantage theory proposed by Porter (1998) appears more valuable to Libya because its priority is to diversify the economy, increase production and create a cluster economy, change eating habits and support food security. The ELG model can be vigorously applied having grown the fish industry to a sophistication level that it can compete in the export market. The differences in cultures, history and economic structure (particularly those countries whose balance of trade overwhelmingly depend on oil) affect the international competitiveness of a country.

5.1.2 Competitive Advantage Theory

According to traditional economic theories, competitive advantage is gained from factors of production (land, labour, natural resources, capital and infrastructure). Not satisfied by this classical (e.g. theory of absolute advantage and comparative advantage) and new trade theories (based on monopolistic competition) to explain modern trade patterns, Michael Porter in 1985 advanced a new theory to explain national competitive advantage that helps firms and policy-makers with practical solutions to competitive advantage theories. Porter (1985) warned that the established principle of trade which could be traced back to Adam Smith and David Ricardo, in most cases, is either incomplete or incorrect (Cho and Moon, 2013). Specifically, he pointed out that a greater number of the trade theories based on this doctrine tended to focus on cost. Porter (1998) posited that: "a new theory was essential that should attract a comprehensive understanding of competition that contains segmented markets, differentiated products, the technological differences and economies of scale". Warf and Stuz (2009) have equally argued that competitive advantage maximises economies of scale in goods and services, unlike comparative advantage theorist that can trap countries into low terms of trade.

Porter's mission was to define why companies or industries from certain nations implement better strategies than others competing in certain sectors (Bakan and Dogan, 2012). His arguments was captured in a book titled' *Competitive Advantage of Nations*', and were lauded for creating a link between the theoretical literatures in strategic management and international economics, and providing the basis for improved national policies on competitiveness (Davies and Ellis, 2000). In particular, Porter's theory sought to shift focus from natural endowments of a nation as key determinants of a nation's competitiveness to the nation's environment and governmental policies. Citing Japan as an example of a nation that had achieved international competitiveness despite lacking natural resources, Porter argues that national prosperity is created and not inherited (Heckscher, 1991; Yoshitomi, 1991; Smit, 2010; Barbe and Triay, 2011). He contends that competitive advantage is created and sustained through a highly localised process influenced by differences in national values, culture, economic structure, institutions and history of the specific nation (Montgomery and Porter 1991; Cho and Moon, 2013). His main argument therefore is that a nation succeeds where the country's environment helps to develop the proper strategy for a particular industry or segment (Porter 1990).

This argument has been reiterated by a number of scholars who have presented empirical evidences pinpointing government policy as the main factor responsible for achieving national prosperity and competitiveness (Dunning, 1995; Deraniyagala and

Fine, 2001). According to Zahia and Chaoui (2010), the subject of developing competitiveness has in recent times gained widespread interest at the global level, and currently occupies the top of the list of concerns and brigades for various countries around the world, especially developing countries. This concern can be attributed to the desire of many countries to keep pace with rapid developments witnessed around the world which has made it difficult for any country to live in isolation from the rest of the world. Particularly, pertinent to many developing countries in seeking to be global competitive, are the emerging difficulties and obstacles in the fields of export. These concerns on export may be considered misplaced by Porter (1985), who argues that productivity and not export is the main factor of international competitiveness. Porter maintains that national productivity, measured in terms of GDP per capita is: "the best single, summary measure of microeconomic competitiveness available across all countries" (Porter 2002:8). He stresses that for any country, productivity and not export should be the goal since productivity supports high wages, and similarly, a strong currency and attractive returns to capital results in a high standard of living (Porter and Ketels, 2007). He explicates that a combination of export, domestic learning by doing and access to international technology are indeed good for productivity (Isaksson et al., 2005). In addition, Barragan, (2005) argues that productivity depended on level of skilfulness amongst workers, state of technology development, quality of products and reduction of productivity costs.

Another key factor for productivity and thus a nation's competitiveness, according to Porter's theory, is the capacity of its industry to innovate and upgrade. Industries that achieve competitive advantage are those that approach innovation in its broadest sense, including both new technologies and new ways of doing things. Indeed, Zahia and Chaoui (2010) emphasised that innovation factors are increasingly important in the ability of the economies of countries to improve their independence and promote well-being in the future. Porter's position that in modern times this relationship underscores the need for business sector, government and civil society to collaborate in forming an integrated learning system and enabling environment that promotes innovation.

Another significant factor of competitiveness according to Porter is domestic pressure and challenge. He posits that companies are able to gain advantage over the world's best competitors if they have strong domestic rivals, aggressive home-based suppliers and demanding local consumers (Cho and Moon, 2013). In modern global landscape, nations succeed in particular industries because their home environment forces them to innovate and improve faster than their competitors (Porter, 1998). Significant to note is the fact that Porter's postulations as discussed above was arrived at from empirical evidences obtained from four years study of 100 sectors in ten countries - USA, Germany, Denmark, South Korea, Britain, Italy, Sweden, Switzerland, Japan and Singapore (Öz, 2002).

Indeed, Competitive advantage theory is one of the most popular competitiveness assessment models that have attracted a number of studies, interest and applications, due to contemporary issues challenging the performance levels of individual firms and nations (see section 4.2.2 for examples). Of significant interest has been the fact the theory allows for the factors determining competitive advantage to be created or, at the very least, allows for significant improvement to be made in productivity, particularly as a key element of export strategy or in promoting economic growth and diversification. This is one of the most important merits of this theory that this study benefits from in promoting Libya's economic growth and diversification through the use of fisheries as a non-oil sector.

Porter (1998) elaborates his theory from the following premises: 1) competitive advantage sources vary among industries and even amongst the same industry; and 2) change and dynamics are essential qualities that keep the advantage competitive because they are important factors for the promotion and development of innovation. Therefore, competitive advantage theory promotes innovation and upgrade which comes from multiple paths; by updating old ways, inventing new ways, new technology, or the development of labour skills, and so on. It is as a result of investment in ideas and knowledge as well as in physical assets that accumulates and results in firm's growth and productivity. But innovation alone is not enough as it needs continuous improvement and development based on the dynamism of the industry, so as to maintain its competitive advantage. Porter (1985:1) believes that:

> Competition is at the core of the success or failure of firms and competition determines the appropriateness of a firm's activities that can contribute to its performance, competitive strategy is the search for a favourable competitive position in an industry to establish a profitable and sustainable position.

Porter (1998) confirms that competitive advantage cannot be understood by looking at the company as a whole, but it stems from the activities performed by the firm in designing, producing, marketing, delivering and supporting its output. The combination of these activities could contribute to the development of the relative cost of the company and serve as a basis for differentiation. In competitive advantage, the firm in the industry determines whether profitability is higher or lower than the average industry profitability. The basic rule of the performance above average is the sustainable competitive advantage, i.e. the extent to which the firm has sustainable competitive advantage. Any strengths or weaknesses that can be owned by an enterprise are a function in its impact on the cost or differentiation. These advantages (cost and differentiation) stem from the organisation's ability to keep up with five forces (suppliers, buyers, substitutes, new entrants, competitors) in a way that is better than its competitors. National and corporate competitiveness has also been found to be positively related to individuals' desire to maximise profits, labour availability and comparative cost advantage (Murphy, 2001). Companies from some of the nations with short supply of labour and high wages have however become competitive through mechanisation and restructuring of processes (Barbe and Triay, 2011).

In many developing countries like Libya, resources, especially oil, is seen as the only opportunity in developing competitiveness. This should not be the case, as competitive advantage can grow out of selective factor disadvantages, factors that are considered a source of disadvantage which are basic factors. Porter (2002) outlined three broad stages of economic development, starting with the 'Factor-Driven Sector'; which can be transformed into a source of advantage by sustained investment (see Figure 4.1). At the very basic level of economic development, the factor-driven sector (otherwise known as resource-driven sector) competitive advantage is determined by natural resource abundance and cheap labour. This is the stage where many developing countries are mired. Export-led productivity is very low and the products are typically low-value added. However, oil-rich countries, as in the case of Libya, have a well-developed export market for petroleum products. The Libyan economy has come to be highly dependent on oil which is subject to external price volatilities. The over-dependence on oil has led to the collapse and poor performance of other non-oil sectors (Porter and Yergin, 2006). In this stage, revenue gained from export should be invested into the wider determinants of national competitiveness. For example, human capital can be significantly upgraded by sustained investment (Heeks, 2006). The 'Investment-Driven Sector' is a stage where countries improve on their factor-driven sector, as well as firm strategy, rivalry and technology, to make them increasingly sophisticated. The business environment is also improved upon through regulations, legislations and policies. While promoting foreign investment, in-country business alliances are also encouraged for skills transfer and domestic market expansion. The last stage, 'Innovation-Driven Sector', can be reached through sustainable upgrading of the 'Investment-Driven Sector'. At this stage of competitiveness, countries competitive advantages lie in their ability to innovate and produce goods and services that can compete at the international markets, whilst satisfying local demands. This can be achieved through: 1) technological diffusion, improvement and upgrading of production methods; 2) establishing efficient local environment for innovation; 3) supporting institutions that support innovation; 4) developing export service capacities; and 5) new marketing and identifying new customer groups.

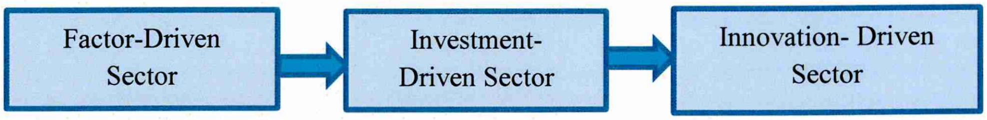

Figure 5.1: Stages of Competitive Development. Source: Porter (2002)

As indicated in the following section, Michael Porter suggested the need for a new paradigm that analyses the reasons why particular countries have competitive national advantage over their rivals in global competition. Porter used a diamond shaped model to illustrate the factors that determine the international competitiveness of country's industries. This diamond represents a template countries can use to establish industries that would remain sustainably competitive and not serve only short-term gains. At the same time, this process provides a framework in explaining, comparing, contrasting and assessing why some national industries fail to grow (Porter, 1998:131-132). As noted in section 1.3, Libya has numerous resources (such as marine, minerals etc) besides of oil and gas. However, given the limited capacity of non-oil sectors to grow, coupled with small but increasing population, constrain economic growth. As the Libyan society advance, together with the current uncertainty in the international crude market, there is the need to use Porter's model of national competitiveness to grow the economy by developing non-oil sectors (such as fisheries) that are not finite, have reduced exposure to external macro-economic shocks, and would be competitive in both local and international market. For example, Abdulla (2014) study of the competitiveness of Libyan business environment using Porter model concluded that the Libyan investment environment has the potential and capacity to attract sophisticated multinational corporations, such as the ones in the oil industry, despite the numerous obstacles and shortcomings associated with the Libyan society. Lastly, this is Michael Porters view about reluctance of nations to succeed in the current competitive era:

> "In the modern global economy, prosperity is a nation's choice. Competitiveness is no longer limited to those nations with a favourable inheritance. Nations choose prosperity if they organize their policies, laws and institutions based on productivity. Nations choose prosperity if, for example, they upgrade the capabilities of all their citizens and invest in the types of specialised infrastructure that allow commerce to be efficient. Nations choose poverty, or limit their wealth, if they allow their policies to erode the productivity of business. They limit their wealth if skills are reserved only for a few. They limit their wealth when business success is secured by family connections or government concessions rather than productivity." (Porter, 2011:2)

It would be interesting to contemplate where Libya stands in all of this, particularly as it relates to developing fisheries as an alternative means to achieve economic diversification. As Porter (1998) emphasised, and as noted earlier, competition is in perpetual state of change – improvements in industries are never ending processes. In contrast, Libya's fishing sector has been static and comatose, and the improvements made by Libyan government in the 1990s when it paid attention to agriculture have become a once-and-for-all event (Ghanem, 1987; Omar, 2003). The diamond model first developed in the book, *The Competitive Advantage of Nations,* attempts to explain why particular industries are more successful and competitive in particular locations than in others. In brief, the models attempt to describe the key components and interactions needed for industry clusters to be successful, or achieve so-called 'competitive advantage'. On relating to the traditional factors of production, competitive advantage rest on the notion natural resources wealth does not necessarily make for a good economy and that cheap labour is ubiquitous.

5.2 Porter's Diamond Model of Competitive Advantage

Based on 100 case studies conducted for four years from 10 countries consisting of eight from developed nations (the United Kingdom, Germany, Denmark, Switzerland, Italy, Japan, Sweden and the United States) and two from the 'Asian Tigers' or 'newly industrialised' countries (Singapore and South Korea), Porter proposed four determinants of national advantage that allows domestic industries to gain and sustain competitive advantage. Analysis to why some regions are more competitive than others and how firms gain superior position in certain sectors can be found in six factors. These are: 1) factor conditions, 2) demand conditions, 3) related and supporting industries, and 4) firm strategy, structure and rivalry. Government and chance (exogenous shocks) are the two factors that influence the determinants in national competitiveness but are not determinants themselves (Figure 5.2). Porter's model, which he calls the '*diamond*', refers to a diagrammatical expression (unlike many alternative academic models) that does not depend on complex mathematical expression or subtle assumptions.

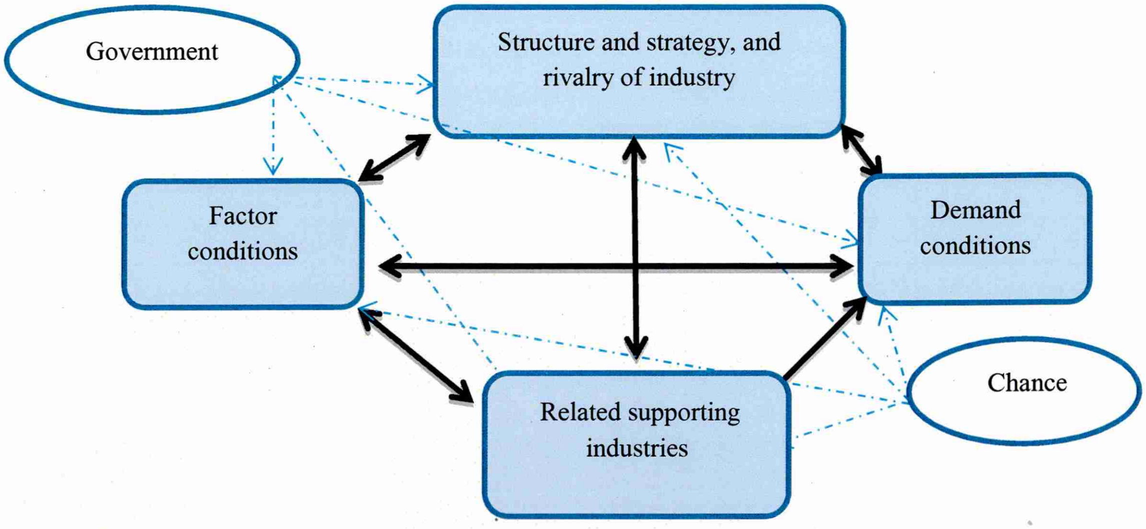
Government
Structure and strategy, and rivalry of industry
Factor conditions
Demand conditions
Chance
Related supporting industries

Figure 5.2: Porter's Diamond Model of Competitive Advantage. Source: modified from Porter (1990; 1998)

Together, these six determining factors form a system that differs geographically, thus accounting for the success/failure of firms in a particular location. The factors for competitive advantage are dynamic and the bi-directional influences between all factors create the dynamism of the model, and also point to the inter-linking relationships that could be established. Accordingly, not all the six factors have to be at optimal level for industries to succeed, so also the dynamics of the factors are not evenly spread in a country, but concentrate in clusters that have reached higher levels of competitiveness. The factors for Porter's diamond model indicated in figure 5.2 are explained below. These factors can be used in analysing and developing industry and in setting diversification strategy. According to Porter (1980), it also allows decision makers to spot an industry with a good future.

1- Factor Conditions

Factor conditions are intended as factors of production, which include:

a) Human resources: quantity, skills, costs of labour, the time of working, attitude to working and level of education.

b) Knowledge resources: the supply of scientific, technical and marketing knowledge used for creating and distributing goods and services. This knowledge is located in universities, research institutes, informational systems, data banks, commercial associations, and so on.

c) Physical resources: abundance, quality, accessibility, mineral, fishing grounds, and so on.

d) Financial resources: level and cost of the capital available for financing the industry.

e) Infrastructure: the transport systems, post, communications, different infrastructure elements that determine the attractiveness of a country regarding the quality of life, work conditions (culture, health) and so on.

From Porter's (1998) point of view, there are two types of production factors:

1) Basic factors, which include resources, location, climate, skilled and non-skilled labour and basic debt capital. These factors can be met in many countries; however, they are not sufficient to gain competitive advantage. Porter suggests that the advantages of the basic factors are often fleeting.

2) Advanced factors are the most important to obtain competitive advantage. These include infrastructure, modern digital communications, people with very high level of qualifications, research institutes in advanced disciplines and so on. Advanced factors are often rare and require large and constant investment. Many advanced factors build on the fundamental factors that should be sufficient in terms of quantity and quality.

Porter also divides production factors by their specificity:

1. Generalised factors, such as providing loans, the general transport system, and those groups with university education. General factors exist in all countries.
2. Specialised factors, such as databases in the field of science and staff and skilled labour, infrastructure with distinct characteristics, and so on. Specialised factors are most critical to the sustainability of competitive advantage. In addition, specialised factors need to focus more on private investment to drive innovation through venturing in research and development. For competitive advantage to be maintained there must be improvement and promotion of current technical realities. For example, science is constantly evolving; what is a specialist factor

today will be a generalised factor tomorrow because of rapid technological advancement.

Factors which are inherited by a nation require continuous development through investment and the factors developed are the most important to achieve sustainable competitive advantage. Porter (1998) also explained in his book that, it is the factors which are created and not those that are inherited, that are the most important for a sustainable competitive advantage. For example, Germany, Switzerland, Korea, United Kingdom and Japan are successful trading countries but disadvantaged in natural factors of production. The United States has large supply of natural factor of production and their successes not only depend on inherited resources, but on the mechanism put in place to constantly create and upgrade these factor conditions (Porter, 1998). In contrast, Libya is yet to derive successes from factor conditions of physical resources apart from oil. Industries always seek to create important tools to compete, such as worker education, training programmes or private institutions. In addition, states differ in the mechanisms they employ to create sectors that play a leading or a distinct role. In Japan, the public sector takes this task upon itself, whereas in Italy the mechanism started with the extended family. The extent of the effectiveness of working conditions on the other determinants is shaped in the form of a diamond, such as domestic demand conditions, related and existing industries, goals of the company, the nature of competition and the direction of local government investments. For example, lack of employment can create this defect feature upgrade and increase the productivity factor, and domestic demand conditions send signals to policymakers.

2- Demand Conditions

Demand plays a vital role in creating competitive advantages. Competitive advantages are influenced by domestic demand, which has a substantial impact through stimulating innovation and improvements that are required for domestic companies to compete with foreign competitors. Therefore, competitive advantage needs a strong domestic market. Domestic demand features that affect the competitive advantage are:

- Structure of the domestic market
- Sophisticated and demanding buyers
- Anticipatory buyers' needs

A large local market stimulates the expansion of investment and development and thus helps to create a competitive advantage. In the case of a small or weak domestic demand, such as the fishery industry in Libya, companies or industries chance to obtain competitive advantage is further brightened by moving to international markets. The nature of domestic demand is more important than the size of the request. It is buyers who inspire and put pressure on the company to innovate and improve the product, and so doing it reaches a more specialised stage than that of foreign competitors. Desire for a product or service starts with domestic pressure, and then spreads from that local setting to other countries and up to the global stage. Local needs and conditions might orientate the market to produce goods with particular characteristics and this stimulates invention and thus gains a competitive advantage for the state. For example, responses from case study in chapter eight indicate that the demand for fish will increase with high quality fish supply similar to those imported from Tunisia or Morocco (see sections 1.3 and1.4). This means that the emergence of foreign competitors stimulate home consumer sophistication and expects improvement on the current standard of fish. There is also a growing demand for fish from non-Libyans, but the low quality of fish delivery has been consistently questioned. As majority of the migrants that make up more than 12 per cent of the over six million total population of Libya are fish consumers, particularly those from Egypt, Tunisia, Niger, Chad and Morocco (see UN, World Migration Stock, 2012; UN World Population Prospects, 2012 and sections 1.1), then fish market anticipates expansion and must therefore innovate to satisfy demand. However, domestic market impact depends on the rest of the factor determinants.

3 - Related Industries and Industry Support

While it is difficult to achieve competitive advantage through the individual presence of industries, it is easier through association with other industries which are complementary, in the sense that the presence of industry is part of an industrial cluster. Porter (1998) defines clusters as: "geographic concentrations of interconnected companies, specialised suppliers, service providers, and associated institutions in a particular field that are present in a nation or region". It is also worthy of mention that clusters may arguably have deeper roots in development economics: this idea of Porter overlaps with those of 'unbalance growth' (Hirschman, 1958) and notions of 'export led growth', when applied to the context of developing countries (Palley, 2011). The export process may need equipment and materials for manufacture within the economy to stimulate investment in other industries; and might result in an economic cluster configuration. Hirschman refer to unbalanced growth as 'backward and forward linkages'. Backward linkages refer to the growth of a group of industries whose supply stimulates the growth of raw materials, and forward linkages are growth that connects producers with consumers (Malhotra and Jain, 2009).

Clusters represent an important factor in achieving competitive advantage whether at the local or international level. The presence of local industries able to compete with international industries plays an important role by supporting other competitive industries in the local region. In addition, the direct and continuous coordination between inter-related industries and cooperation in the field of development and innovation stimulate and accelerate innovation process in the entire industrial sector. A cluster of industries which depend on a common input, such as infrastructure and skills, will stimulate companies and government institutions to invest in the creation of the relevant factors (Porter, 1998). The related industries, which complement each other leads to the development of clusters, and often initiate the formation of economic power which is difficult to imitate and thus, create a competitive advantage. For example: 1) Industries related to upstream are related to inputs of fishing industry where production process needs multiple types of industrial inputs such as boats and fishing gear. 2) Industries related to downstream are industries that deal with the output from core activities obtained, which represent the fish in this study, and examples of these industries are those related to sorting, transportation and processing, fish canning factories as well as feed mills.

The foregoing discussion on attributes of clusters, suggest that patterns of knowledge flows may vary from cluster to cluster and also within countries specialised around different clusters (OECD, 1997). Arguably, it is the pattern of the knowledge flow within a cluster that determines its overall level of competitiveness. The overall level of innovative performance by each cluster is largely influenced by the extent to which the close working relationship within the cluster allows for suppliers and end-users to utilise information, and exchange of ideas to innovate and upgrade their factor conditions (Cho and Moon, 2013: 72).

4 - Company Strategy, Structure and Nature of Competition

This means everything that has to do with the context of the establishment of companies, organisation and management as well as the nature of competition in the local market. Also, there is the effect of the relevant aspects with practices of local cultures that materialise as a result of the social system, religious and educational factors. In addition, conditions and the environment of business and commercial facilities, management style and strategy all have direct impact on competitive advantage. Companies are managed according to strategies which vary depending on their objectives and the approach followed by managers of these companies. The individual excellence which comes through high-level training is also necessary and required for the continuation of competitive advantage.

There is an increase in sophisticated demand and competition in the domestic market between imported and locally produced fish in Libya. Although this competition may be important and beneficial, as it was to Switzerland, Japan and Singapore, it compels firms to reduce their costs and improve the quality of their products. According to Porter (1990), the existence of intense domestic rivalry is of special importance, since it influences innovation and change in firm's production strategy. This section of the thesis analyses the current mixture of Libyan fish market structure - their capacity in meeting national demand and the export market and their organisational characteristics that fits well with competition.

5- The Role of Government

Apart from the above four factors, government's role and chance event are the two complementary determinants that can importantly affect the national system. Governments play a role in influencing the gain of a competitive advantage: they have the power to affect competitiveness - positively or negatively - through intervention in politics, economy and society. Governments affect competitive advantage through investments and subsidies, both for the development of human resources through education, research and training or through support given to producers or production companies, which reduces input prices, as well as creating a competitive environment that allows for the development and promotion of industries. Governments therefore have an impact on all determinants of competitive advantage, but the extent of involvement is what matters. In Japan, for example, government's intervention in such important industries as steel, shipbuilding, copiers, robotics, has been minimal and viewed as an example of successful policy. Porter (1998) also points out that government policy will be doomed to failure if it is the only source of competitiveness support. The success of a government's efforts depends on the presence of the four determinants of competitiveness. The peripheral role of government in Porter's model has been questioned in this research. This is against the background that Libya is a developing country and government dominates all sectors of the Libyan economy – it is an owner, operator, regulator and administrator (see also Jasimuddin, 2001 for a similar example from Saudi Arabia). As indicated in Chapter Two, Libyan government is playing a dominating role in all sectors of the national economy through monopolies, trade barriers and regulations. Government's involvement in the fish value chain instead of making it competitive ended up being less attractive. Using the competitive advantage theory, new, constructive and actionable roles for government and business will manifest for competitiveness and growth. As advocated by the ELG, government's intervention in production should be minimal.

6 - Chance

Porter suggests that opportunities play an important role in gaining competitive advantage. A lot of events that change market parameters (such as wars, oil shocks, new inventions, exchange rate changes, changes or surge in demand, political instability) may create valuable opportunities for many competitors to excel because of changes in the cost of production or the availability of financial resources (Smith, 2010). These events, either unforeseen or predicted, may bring opportunities for changes or remoulding the sector for a shift towards competitive position, in response to new and different conditions. Unfortunately, this is not the case in Libya as productive sectors of Libya instead of progressing are retrogressing and shocks in oil prices has led to budget deficit in the past. For instance, the Libyan conflict has derailed development plans and brought to bear the consequences of depending on oil as the only source of income. According to Washington Post of February 18, 2015, Libya is now scrambling to finance budgetary allocations, pay huge bill for wages and subsidies due to low export of oil, crash in oil prices and the raging war between two competing governments vying for power and resources. However, it is anticipated that the current situation will stimulate the chance for an investment in non-oil sectors to play a significant role in a post-conflict Libya, taking into account the first four determinants. For example, the competitive position of the Libyan fish industry is weak. Yet, respondents interviewed believe that the industry has future potential (see chapters eight and nine). This strong belief was based solely on one factor condition – the abundance of fish stock due to the length of Libyan coastline. Lessons can be drawn from the United States on how the post-World War II investment in the above four factors translated into creating world leading industries (see, Porter, 1998:294). As already stated in Chapter one, this study used the 'diamond' to analyse the determinants and how each determinant functions and interacts with the other determinants in Libyan fisheries. As Porter's diamond model can be applied to any organisation or industry, the following section contains examples of application.

PDM argues for a dynamic system that is able to respond innovatively to both negative and positive effects as the current Libyan situation shows. Specifically, the model allows for broad and common interaction amongst the various industry players leading to constant production of new knowledge thereby causing global competitiveness (Erkan and Ve Erkan, 2004). The interactions as proposed in this model are hinged on four factors that present a diamond; strategy, structure and firm rivalry; conditions of input factors; demand conditions; and related and supporting industries (Cho and Moon, 2013). According to Porter, it is the developed, intense and innovative interaction of these factors that generate productivity and spur a sector's export growth (Vuković et al., 2012). In emphasising a dynamic and competitive environment, Porter's model abandoned the conventional economic thought "Ceteris parabus assumptions do not work, Managers must consider everything, I concluded that we needed frameworks rather than models'',(Aktouf et al., 2004).

5.2.1 Assessing Porter's framework for National Advantage

Cho and Moon (2013) and other scholars have lauded Porter for the expertise with which he assimilated the key variables that determine a nation's competitiveness into one model. The key attributes of the model that have received wide support include: the model's advocacy for differentiation and domination by costs; its capacity to bridge the gap between strategic management and international economics; its ability to merge both industrial organisation and strategy use and the fact that it was easy to comprehend and implement (Aktouf et al. 2005; Grant 1991: 535). Equally extolled is the model's prioritisation of home learning as a stepping stone to global engagement (Pressman, 1991). Bosch and de Man (1994) have also supported Porter's claim that innovativeness supported by a robust business environment (and not the rich amount of production of factors) is the key to a country's success in the world market. That the model provides a framework for comparative environment analysis is also considered a key strength.

The application of Porter's model in understanding the competitiveness has however, not been devoid of some controversies; there has been disparate opinion in particular, on the role of the government in achieving national competitive advantage (Foster and Davis 1995). It has been argued that government should employ strategic policies aimed at contributing to the competitive performance of strategic target industries. On the other hand, there are those who believe in a 'free market' dogma and insist that the working of the economy should be surrendered to the invisible hand (Foster and Davis, 1995). In addition to the foregoing arguments for and against direct involvement of government in shaping international competitiveness, scholars in international business have argued for the inclusion of government condition and macro-economic policy as key dimensions of international competitiveness thereby disagreeing with Porter's position that the two should be considered exogenous factors (Cho and Moon 2000; Moon et al., 1998; Rugman and Verbeke 1990).

Porter (1998) argues that the role of government must be indirect. Similarly, Porter underestimated the major role played by the governments of newly industrialising countries in developing their competitiveness at national and international level. Economic policies in many of these countries promoted export policies targeted at sectors with higher competitive advantage strategy (e.g. automobiles and computing) (see, for example, Yao and Wei, 2007).

Generally, critics in this instance wondered whether Porter did not err in not making government the fifth determinant (Van den Bosch and de Man, 1994). As the economy is advancing, Korea and Taiwan for example, have reduced government's role in their economies, while Hong Kong is still the world's freest economy with limited government interference (Cho and Moon, 2013). Foster and Davis (1995) raised objections to both conclusions, arguing that either of them would lead to the permanent erosion of a country's competitive capabilities: They contends that, on the one hand, advocating for government help presents a risk of proposing policies that would actually hurt companies in the long run by inculcating a culture of dependency. They equally argue that supporting a weak government presence would be tantamount to undermining the valid role of the government in creating a supportive institutional infrastructure and an enabling environment for inspiring companies to gain competitive advantage (Porter, 1985). Departing from the two views, they suggest that government's proper role should be that of a catalyst and challenger; focusing on encouraging and pushing companies to raise their aspirations and move to higher levels of competitive performance, even though this process may be inherently unpleasant and difficult (Porter,1990).

While adding support for some form of government role, Cho and Moon (2013) caution that government's success is only guaranteed under favourable core conditions in the diamond. Even with this limitation, they emphasised that government's role in conveying and strengthening the forces of the diamond is critical and that successful government policies designed for this intent sought to spur the companies' competitiveness rather than attempt to involve the government directly with a sector. They however pointed out that nations in their formative stages of development were exempted from this rule. The nature of government participation is another aspect of Porter's model. Porter argues in his model that the economic competition is between firms in industries and not nations. For this reason, he argues that policy development process should be informed by realities at both meso-and-micro levels Bosch and de Mann (1994) point out that in the past policy makers dwelled attention to the firm as an innovating entity. Extending the discussion on the role of government further, Anderson Consulting (2003), suggest that encouraging change, promoting domestic rivalry and stimulating innovation should be the core principles that inform government's role in supporting national competitiveness. In terms of specific policy approaches they advocate for specialised factor creation and taking critical responsibilities for core sectors like education, national infrastructure, research and health. On his part, Aku Kwapong, (2005), advice government to avoid intervening in factor and currency markets and reject managed trade, and instead, focus on enforcing strict product, safety, and environmental standards, promoting goals that lead to sustained investment, deregulating competition, and enforcing strong domestic antitrust policies, and reject managed trade .

PDM has been criticised also by Davies and Ellis (2000), who pointed out international industries that are successful, but did not have a strong diamond or innovation-driven stage. Furthermore, in PDM the major comparative advantage sources for developing countries are out of sight (Davies and Ellis, 2000). Critics have also argued that PDM lacks the capacity to predict, especially in light of a chance definition, which is an unexpected event. Also the dynamism and the inter-relationships between the determinants make it difficult to predict how a particular combination of current factors will emerge in the future (Heeks, 2006). Grant (1991) also argued that the determinants of competitive advantage are not clearly defined. Another important criticism is that, although Porter emphasises that innovation and promotion is the way to obtain and maintain a competitive advantage, his model did not include details of how this is achieved. There is therefore a need to learn details of the processes and the transfer of knowledge, learning and innovation (Grant, 1991; Dayasindhu 2002; Wignaraja, 2003). The value of foreign direct investment (FDI) in national competitiveness as presented in Porter's model has also attracted criticism from other scholars. Cho and Moon (2013) for instance, considers Porter's suggestions on the role of outward and inward FDI in creating competitive advantage as shallow and not comprehensive. This contest was made based on the competitiveness of the Canadian markets and production. Canadian scholars have argued that advancements and innovations orchestrated by both foreign and local Canadian owned firms are not significantly different. Similarly, they recognised that the 20 largest United States subsidiaries in Canada export as much as they import. Using this scenario as an example of unique cases, they repute Porter's suggestion that foreign subsidiaries may not be reliable sources of competitive advantage and that inward FDI may not be entirely healthy for the economy.

Rugman (1992) also strongly disputes Porter's position on 'in bound' foreign direct investment arguing that Porter's case study of Canada's competitive advantage has not adequately captured the Canadian competitiveness. He argued that while Canada's clusters are resource-based driven, value additions were made for sophistication in product and price, which debunks Porter's statements that Canada is on a stage one factor-driven economy, as simply inaccurate and misleading. Furthermore, even as Canada is abundantly rich natural resources, it does not rely on them as bad as reliance on unskilled labour or simple technology. According to Rugman (1992), Canada's successful and sustained competitive advantage lies on its ability to continuously utilise natural resources capacity to develop complex production capacities. In summary, Rugman's contention is that Porter's model is limited in linking multinational activity in a country's competitiveness drive. Nonetheless, even Rugman harboured doubt on the possibility of incorporating multinational activity on the original Porter's model. This uncertainty is aptly captured in the following statement that is attributed to him: "It is questionable if multinational activity can actually be added into any, or all, of the four determinants, or included as a third exogenous variable'' (Cho and Moon, 2013:108).

Given the above limitations, Rugman and other scholars concluded that PDM appears more appropriate the study of large economies and not small non-triad nations such as Austria, Australia and Finland among others (Rugman and D'Cruz, 1993, Davis and Ellis, 2000; Dunning 2005). As a result they proposed a modification of Porter's model to a double diamond framework which would allow for the integration of small economy's diamond alongside the diamond of its largest trading partner, which are invariably larger economies (Rugman and D'Cruz 1991, 1993). As indicated in figure 5.3, this approach, developed by Rugman and Joe D'Cruz in 1991 allows for the double model to cover the same four determinants (factor Conditions, Demand Conditions, firm strategy structure and rivalry and related and supporting industries) of competitiveness as the initial PDM, but the diamond is further divided into domestic and international diamond (Balcarová, 2013). Specifically, the DDM framework contains three extensions to the PDM. First is the incorporation of multinationals into the diamond instead of recognising them as exogenous activities. Second is the ability of the model to operationalise both domestic and international competitiveness paradigm. The third one is the inclusion of government as an endogenous variable which influences the four determinants (Sardy and Fetscherin, 2009). It's main departure from Porter's Diamond model as argued by its key proponents, is the ability to further conversation of competitiveness right from the country of origin competitiveness to the challenges face by those industries in the international markets.

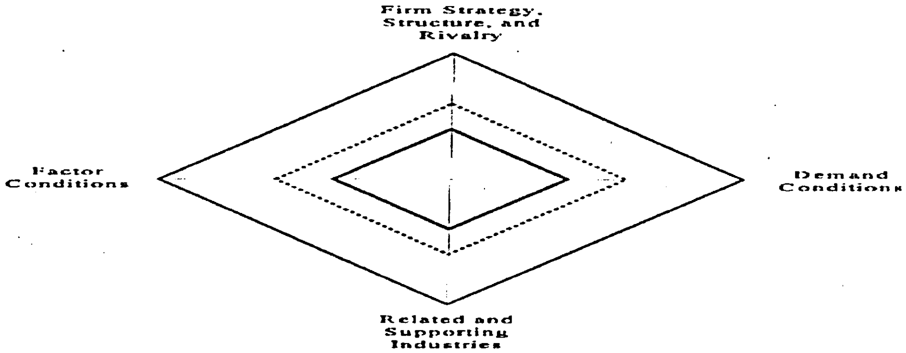
Firm Strategy, Structure, and Rivalry
Factor Conditions
Demand Conditions
Related and Supporting Industries

Figure5.3: The Generalised double Diamond model

Source: Moon et al., (1998) - a generalised double diamond approach to the global competitiveness of Korea and Singapore

The new model suggests for example that for Canada to become globally competitive, Canadian managers need to design strategies across both the U.S and Canadian diamonds (Rugam, 1992). Accordingly, the Canadians are expected to view the U.S market as a home market, not just as an export market, thus allowing for continued consideration of elements in the Canadian diamond but preventing over reliance in it. The proposal was not considered entirely foreign given that in practice Canadian businesses used North American benchmarks in their search for global competitive advantage. In other words, the operations of most of the large firms in Canada are already based on the double diamond framework (Rugman and D'Cruz 1993). The fact that Porter could not perceive this reality, led Rugman to conclude that Porter had limited understanding of the 'nature and the role of multinational enterprises in a small, open and trading economy like Canada (Rugman 1992). Application of the double model in explaining the global competitiveness of some countries has revealed different results from those arrived at using Porter's Diamond model. In considering both domestic and international determinants through the Double Diamond Model (DDM), researchers have come to the conclusion that South Korea seemed less competitive internationally than Singapore. They argued that this was the case because Singapore had a much larger international diamond than South Korea who on the other hand had a larger domestic diamond. The conclusion discredits Porter's conclusions who restricting himself to the comparison of the two countries domestics' diamonds concluded that South Korea is more competitive than Singapore (Sardy and Fetscherin, 2009). The main assertion by the DDM proponents is that global competitiveness has to be considered as a function of both domestic and international determinants given the indigenous role that multinational activities played in the global economic environment (Cho and Moon, 2000).

Sticking with the Singapore case, Cho and Moon (2013) explicate further the methodological differences between This contradicts Porter's (1990) position that the most effective global strategy is to concentrate as many activities as possible in one country and to serve the world from this home base.

Cho and Moon (2013) consider the above argument by Porter narrow in regards to multinational activities and attribute Porter's underestimation of the potential of Singaporean's economy on it. They fundamentally reject Porter's assertion that Singapore is largely a production base for foreign multinationals, attracted by

Singapore's relatively low cost, well educated work force and efficient infrastructure. In their view, Singapore is the most successful economy among Newly Industrialised Country (NIC) and attributes that success to both inbound and outbound FDI. While admitting that the country's cheap labour and natural resource attracted inbound FDI, they insist that the maintained competitiveness of Singapore's industries is due to domestic and international diamond determinants. The most important difference between the single diamond model (Porter, 1990) and the generalised double diamond model is the successful incorporation of multinational activities in the latter (Liu and Hsu, 2009).

A key strength of the Double Diamond Model framework is that it operationalises a domestic and international competitiveness paradigm and thus allows for examination and comparison of specific industry competitiveness across different countries. Using this model, Sardy and Fetscherin (2009), were able to examine and compare the industry competitiveness of the Chinese, Indian and South Korean automotive industry. They were able to compare and contrast the different approaches and strategies undertaken by automobile manufacturers of India and China.

Porter model is adopted in this study to apply on Libya at this stage because initially Libya needs to build a local diamond that requires the establishment and composition of all diamond determinants. The application of the double diamond model does not fit Libya simply because the Canadian and the US economies are by far more sophisticated and highly developed that it is a misnomer to compare them with Libyan economy or conditions. For example, the fish industry in Libya is in need of factor conditions and at the same time balance the urgent need to enhance food security. This means it requires developing the domestic market rather than relying on foreign markets to help establish a local productive industries that can modify the structure of the Libyan economy, which currently relies completely on oil. In addition, the negative and overbearing role of government has been less than helpful and the failures of government in the sector are obvious (see Chapter 7, 8, 9). An empirical finding from Libya would contribute to potential modification of the model. Again, the critical role of domestic demand in the Porter model contrasts theoretically with the more standard approaches of export-led growth; this brings in to the fore theoretical discussion on: (1) whether an export-led model could work or (2) the novelty of Porter's model is useful to Libya —all of these are concluded in chapter ten.

5.2.2 Application of PDM in developing countries

There have been numerous discussions on the role of industries and organizations in developing and emerging countries in regards to Porter's model competitive advantage (Teixeira et al., 2010). Many studies have applied Diamond Model to developing countries (e.g. Heeks, 2006; Nater and Cini, 2009; Al-Hiary et al, 2010; Esen and Uyar, 2012; Bakan and Dogan, 2012; Deniz et al. 2013; Bashiri et al. 2013; Abdel Gawad et al., 2014). The results of these studies were varied and different. For example, the Massachusetts Institute of Technology (MIT) Information Technologies and International Development Centre published a paper prepared by Heeks (2006) who applied the diamond model to illustrate India's, successful software industry. Heeks selected competitive advantage theory for three reasons: First, is the fact that it has been tried and tested in many sectors including the software sector, thus ensuring availability of critical information relating to the application of the theory. Second, it is considered within reach - thanks to the diamond model that is seen as the core of the theory of competitive advantage. Third, it addresses some of the shortcomings of the macroeconomic perspective while still allowing for innovation and employment of technology. The results show that some variables do have competitive advantage, such as domestic rivalry, advanced skills, vision and government policy. However, it considers domestic demand of software industry in India as a source of competitive advantage because of its low profitability and small size. This factor is at a disadvantage - rather than an advantage - which has driven entrepreneurs into exports. In a nutshell, in applying the theory they were able to identify the sources and hindrances to the industry's competitive advantage, and consider strategies that need to be taken to maintain the competitiveness of the sector. A key finding in the analysis was that government actions as they were fitted into Porter's recommendations.

Al-Hiary et al. (2010) explored the competitiveness of the Jordanian agricultural sector. Specifically, the authors analysed the country's agricultural cluster to establish how the determinants function and interact with each other. A SWOT analysis of the country's agricultural sector was also done. The findings were that Jordan's horticultural sector held the promise of offering high returns, signifying that the country may have a comparative advantage in fruits and vegetables production. These findings were considered sensible, given Jordan's natural resource and climate that is favourable for the production of a variety of high-quality fruits and vegetables suitable for both domestic and international markets. Furthermore, their findings showed that the current Jordanian agricultural sector does not reflect its full potential. In particular, there are crucial issues concerning product quality and standards, there is a near absence of rivalry, no effective home demand, agro-based industries are scarce and cheap labour is the most widely available factor condition. On the home demand, for example, Jordan has a rapidly growing population and this implies that agricultural products face potential increase in demand. However, local demand in Jordan is largely influenced by price rather than quality, and as such, may deter the sophistication of the industry and pose serious challenges to agricultural development and innovation. These are issues to be recognised if Jordanian agriculture is to develop to meet its potential and compete globally. However, the existence of some related and supporting industries in Jordan that are internationally competitive will support the agricultural sector.

Kuldilok (2009) applied Porter's diamond model and double diamond model to the Thai canned tuna industry to establish its international competitiveness. The study established that the Thai canned tuna industry, which has the largest market share in the world, has strong competitiveness. Thai's competitiveness was established to be as a result of combining the country's diamond model in the Tuna industry with multinational activities to drive a double diamond model. Indeed the initial results suggested that Thai tuna industry is largely dominated by international demand. Kuldilok (2009) established that the country showed competitive advantages in the following aspects: level of productions capacity, labour costs, quality of production, quality of processing and production facilities, storage facilities and quality of infrastructure. Conversely the analysis showed that Thai fishing sector had a number of shortcomings, including, significant losses in operation, high cost of production, tuna stock depletion, poor conservation policies and low level of fishing expertise. Despite the prevailing indication of competitiveness, the study did establish that the future of the Thai tuna industry is uncertain for three main reasons. At first, production has been adversely affected by supply security, which is largely due to decreasing tuna stock from over-exploited fishing.. The challenge of inadequate tuna supply was being aggravated by new fisheries conservation and fisheries management policies. Second, given the above supply challenges, some producers are beginning to find the Thai tuna industry not economically sustainable due to non-cautious utilisation of tuna resources. Some producers have been facing unprofitable market conditions and are finding it difficult to survive as they are perceived to have harvested the maximum sustainable yield of tuna. Finally, the comparative advantage based on low wages cannot be sustained due to rising minimum wages and increasing competition in the Thai labour market as the economy continues to grow (Kijboonchoo and Kalayanakupt 2003). They posited that Thai industry serious threat of decline was to some extent comparable to the US industry decline and warned that in the long term, Thailand's potential in fisheries may not be realised - a situation they attributed to the lack of funding by the country to inject in the industry, limited expertise amongst the country's skippers, depletion of the country's tuna stock and inherent weakness in the countries conservation and fisheries management controls. They however pointed out that the threats could be considerably minimised by developing and sustainably managing a Thai based tuna aquaculture.

Similar to Libya, Saudi Arabia is an exporter of oil, but it is also one of the top 10 countries producing dates fruits for local consumption and export (Abdel Gawad et al., 2014). The poor attention given to Saudi dates despite their superior quality and presence in the global market stimulated Abdel Gawad et al. (2014) to apply Porter model covering 20 year period (1991-2011) to determine how the dates can become competitive in the world market. Based on secondary data which were collected from different local and international resources, the study employed regression analysis, rates of economic growth, coefficients of commodity concentration, as well as indicators of market share, to establish relationship between demand conditions and value of export, as Porter assumed. Saudi Arabia is also facing export market competition from Egypt, Tunisia and Iraq. While Egypt has a huge local market base, Saudi Arabia's market is relatively smaller and as such depended on export market, particularly American and Europe, for the sale of surplus dates. In this instance, Abdel Gawad et al. (2014) recommended further investigation on competitive advantages for marketing with related and supporting industries for value addition in processing, packaging and upgrading the current standard of logistics industries. The investigation aimed at strengthening the data on marketing aspects of competition with Egypt, Iraq and Tunisia. Further, the recommended the study to the government of Saudi Arabia in facilitating proper market for its dates growers and exporters. This examination will strengthen the ability for Saudi dates to compete with rivals and could support government in expanding markets for producers and exporters. Both Porter (1985) and Carpenter and Nakamoto (1989) concur that a differentiated brand with unique, superior and important attribute is the only way to inoculate a brand from the eroding effects of market competition.

Barbe and Triay (2011) carried out an exploratory industry case study using Porter's (1990) model to establish the competitiveness of the Uruguayan broiler industry within MERCOSUR union. Focusing on the six major Uruguayan broiler firms, the study sought to discern management behavioural pattern in Uruguayan broiler industry. In addition, they were keen to establish how the people involved in the industry perceived competitiveness and strategy in the context of the union. Expecting subjective and individually based responses from the participants, the researchers embraced a realism paradigm in the design and conduct of the study. They leveraged on the paradigm's explanatory attribute to establish the root causes of Uruguayan broiler industry competitiveness. The findings indicated a close alignment of the industry with Porter's diamond model but also suggested that a full understanding of the success of the industry could only be explicated through a modified version of Porter's model. The adapted model that they subsequently proposed took in consideration only those factors that had a direct and significant impact on the developments of the firms under study. Accordingly, they isolated only three factors considered from the findings to be the drivers of competitiveness in broiler firms. These were infrastructure, human capital and proximity to the larger centres of consumption. Another departure from Porter's model was their singling out of rivalry from the original firm strategy, structure component. They argued that the original component was 'too broad and lacking in focus', and thus failed to adequately explain the success factors of the Uruguayan broiler industry. The findings have shown that aggressive and intense domestic competition had played a critical role in the development of the industry and that the owner-directors' motivation had also been proven as a key factor in the firms growth, the two were, however, separately considered as independent determinant factors in the adapted model. Consistent with Porter's model, they maintained domestic buyers under the demand factor in the adapted model. This decision was based on the evidence that Uruguayan's consumers demand for cheap sources of protein had pushed the broiler firms to improve their production efficiency. The government role as stipulated by Porter's model was disputed given that the findings showed Uruguayan government's role was not significant having only played a limited role in influencing firm strategy and structure. This limited relationship is captured in the adapted model and is signified by two-way arrows between government policy and firm strategy and structure. Notably, the adapted model has no indication of interaction of government with other determinants of competitive advantage like quality of human resource and infrastructure.

One other key finding from the study was the Uruguayan broiler firms did not have a competitive edge over international or regional firms. According to Porter's model this could be attributed to the protection barriers that had been instituted by the government. Another significant finding in relation to Porter's model was the fact that Chance events seemed to have a greater role in the shaping of Uruguayan broiled companies competitiveness than would be accounted for by Porter's framework. They in particular identified the impacts of military conflicts on international beef price; the declaration of Uruguay as a country free of foot and mouth disease in 1995; and bird-flu, as the three main chance events that enabled the broiled industry to gain a competitive edge of their key rivals in the meat industry. The adapted model thus included the chance events as a main determinant of competitiveness.

Iran is also an oil exporting country that offers a unique case because they have diversified their exports to include non-oil exports, which they consider as very important to their economic growth (Goharian, 1999). In particular, Iran's agricultural sector is more developed than its other non-oil sectors: in 2011, export from Iran's agricultural products was about 40% of non-oil exports. Olive oil and saffron are agricultural products that have long history and exposure to international market. Bashiri et al. (2013) used PDM to investigate the competitive advantage of olive export. The main interest was to establish the level of international competitiveness of Iran's olive industry. The model has proven useful and findings suggest that while factor conditions are not important obstacles to Iran's saffron competitive position, the major determinants include demand conditions, firm strategy, structure, and rivalry, related and supporting industries, government and chance. Another important but less obvious chance obstacle was changes in oil prices and the sanctions imposed on the country reduce export market opportunities. The researchers recommended for increased investment in agriculture and inputs by the indigenous people and government. As technological expertise is severely lacking, they argue that technical knowledge or the transfer of modern and advanced agricultural production methods can only emerge through interaction with foreign enterprises and investors. In the meantime, Porter has stressed that innovation is one of the most important pillars of competitive advantage and it comes in many guises. For example, innovation in the food industry is not limited to technological innovation, but also needs to be accompanied with cultural innovation and social innovation that spreads through the entire food system from the production stage to the distribution phase. In other words, innovation strategies must take into account social and cultural changes to produce foodstuff that satisfies personal, nutritional and social needs of all communities (Earle, 1997). These advantages can be achieved through clusters. A cluster-based approach is seen by Porter (2000) as a realistic way to enhance industrial performance and identify the policy and institutional hindrance to competitiveness and innovation.

Porter (1998) defines clusters as "geographic concentrations of interconnected companies and institutions in a particular field". An agricultural industrial cluster consists of industries involved in two major activities: agriculture production and other agriculture related activities; the agricultural industrial cluster is a vital organisation for not just agricultural but also rural economic development. Specifically, agricultural cluster is considered invaluable in enhancing competitiveness, harnessing development gains made and strengthening of production capability (Song and Chen, 2005). Taing-peng and Xiaing-bing (2011) discussed the industrial cluster of the primary agriculture in China based on PDM. They considered the difference between a primary cluster and advanced cluster, explicating that the former would either be at taking off or expanding stage, while the latter would already be at the clustering stage. They contended that most of the earlier studies seemed to have focused on the advanced clusters, pointing out that at the time of their study there had been no research on primary cluster. In their study they sought to pay attention to both clusters, noting the critical role primary clusters played in the development of the local economy and there was opportunity to nurture and developed primary clusters into advanced clusters.

Using Porter's model, they establish the factors hindering the development of agricultural industrial clusters in the country. Further, based on the findings of the study, they advocated for the development of primary clusters which they argued would enhance the competitiveness of industrial cluster and stimulate local economic development. They projected that ultimately this would 'increase farmers' income, increase job opportunities and better construct the socialist new village (Taing-peng and Xiaing-bing (2011:3). They carried out their analysis on the two categories of the clusters and ended up with mixed results especially as regards the role of the government in the primary agricultural sector. Specifically they noted that the government was indeed providing expected support to the industry especially in regards to provision of farm inputs, building of agricultural infrastructure and skilling of the farmers. This support however seemed to be biased towards the advanced clusters, which resulted in under-development of primary clusters. Consequently, the overall development of the industrial cluster of the primary agriculture seemed to have been badly affected. The researchers pointed out that for the primary agricultural industrial cluster to develop there was need for evidence based trainings, improving the rural infrastructure, branding their products and improving their fund collection mechanisms. In addition they called for strengthening of related industries and what were considered as core industries to the sector. Connected to this was the need to improve the land transfer system and a call for greater government support for the industrial sector.

Khuntonthong et al. (2013) analysed the micro economic environment of agricultural product: applying PDM to a Non–Profit Organization (the Royal Project Foundation) to help farmers gain income in Thailand. Their analysis focused on evaluating environmental factors that had an impact on the success of small scale farmers in high-value market. The level of economic analysis in this study was set at the micro-economic level. It particularly sought to understand the influence of the environment on the innovations for Bresse chicken cluster which seemed to have resulted in a competitive advantage of the Royal Project Foundation and farmers under the project. Both primary and secondary data were collected during the study. They used Semi-structured questionnaires as the main method for the collection of primary data. The questionnaires were administered to a cross-section of the project staff from different units as well as resource persons from academic organisations who worked in the projects as volunteers. A sample of the customers was also interviewed. The researchers established that four environmental factor conditions contributed to the success of the project: evidence based practise occasioned by the support by faculty from universities and related research units, access to both fiscal and non-fiscal resources and well developed infrastructure. In terms of demand conditions, the project benefited from an informed customer base that provided pressure for quality improvement and adequate supply of the products. The project was also found to be thriving due to support both from a relevant cluster and pool of other related organisations. Furthermore, backward and forward linkages and facility for joint working were the strategies that helped the project gain the advantage. The government was also found to have played a role in the improvement of the cluster performance through import tariff and financial support. The chance event was identified to be the growth in the tourism sector which contributed to the expansion of the market for the farm products.

Tavoletti and Velde (2008) designed an exploratory case study of the Dutch flower seeking to establish future opportunities and threats of its flower sector. The study was occasioned by a realisation that emergent development in international markets was a threat to the Dutch flower sector. Indeed, there had been earlier questions on how the Dutch maintained their position as the world's leaders in the flower business despite not having competitive advantage in the conventional sense. Porter's key argument was that the top ranking of the Dutch in the flower business was because the country had innovatively enhanced resource productivity making them overcome the country's natural limitations in the sector. Of particular mention in this regard was the level of investment that the country had made in employing technology and creating highly specialized units. Seeking to explore this situation further, Tavoletti and Velde (2008) sought data through secondary data sources and open ended interviews with producers and dealers during a field visit.

The analysis of their findings led them to agreement with Porter's conclusions underscoring that technology and innovation played a key role in helping the Dutch flower sector gain competitive advantage. Beyond the two factors, they had established that comparative advantage was another very significant contributor of the success experienced by the Dutch flower sector. In particular, they pointed out that the cluster delocalisation trends could be attributed to its comparative advantage. They also noted during their study that there was an interaction between the comparative and competitive advantages of the Dutch sector which was based on social innovation and collective learning. This helped in shielding them from current challenges which include; increasing competition form emergent flower markets like Kenya and Zimbabwe; increasing land challenge orchestrated by increase in population; more stringent regulations by the government of their production styles (as result of concern for climate change) and increasing energy costs due to reduced government energy subsidies. They contend that how Dutch continue to overcome these challenges could not be attributed only to technology employment and innovation, as suggested by Porter, but to a large extent on social innovation. According to their findings, the establishment of saccos and auctions were vital in addressing the challenges because they contributed to the shaping of a local culture that was open and appropriate for the deployment of all kinds of technological innovations. In other words, a key principle that emerged from Westland's region is that ability for collective learning comes from within and not from external pressures as suggested by Porter. This means a parallel can be drawn between this argument and resource based perspective and most current cluster literature (Asheim et al., 2006).

Tavoletti and Velde (2008) also challenged Porter's assertion of local competition as a key driver of innovation. They argued that their findings from the Dutch presented a different reality that made them refute that claim. According to them, the kind of interaction that they had seen between the Dutch growers was not that of aggressive cut-throat competition but more of a constructive process characterised by deliberate imitation of one another for the sake of social change. They agreed with Porter that all strong diamonds originate from favourable factor conditions - a proposition of the comparative advantage paradigm and this would necessarily be followed by two stages in which the competitive advantages are the driving force. From the Dutch study, they contend that there is a possibility of a fourth stage which would be characterised by the combination of the comparative and competitive advantages mostly by foreign firms who have relocated into countries that have a better competitive advantage than their Homebase. The combination is informed by the understanding that competitive advantage is not strictly situated in the local Homebase (Martin and Sunley, 2003). The diamond of the external pressures is also predominantly in the skills and knowledge of the people (Aktouf et al., 2005: 189). This completes the cycle.

Esen and Uyar (2012) noted that the diamond model has been used to explain the tourism sector in Turkey, but it has an insufficient explanatory capacity. Porter states that inherited resources do not create a competitive advantage; however, it is known that the tourism sector depends heavily on natural resources as the main source of competitiveness. Esen and Uyar also claim that because many enterprises in the tourism industry are family businesses, they are not run along lines that include a management structure, nor do they possess strategies for future expansion, thus their volume of business will remain stable rather than increase. On the other hand, government plays a positive role because it reduces corporate taxes and forms tourist clusters. The chance factor is that it is unpredictable, but crisis management could be developed to reduce the negative effects. In addition, Öz's (2002) study in Turkey confirmed that the diamond model works in developing countries. However, some Turkish case studies contradict two of Porter's hypotheses: those concerned with local competition and the role of government, respectively.

There are also many other studies, further to that by Öz, which confirmed that the diamond model can be applied to developing countries, provided some conceptual adjustments are made, but does not mean that all of the diamond hypotheses are acceptable. Empirical studies have also confirmed that all the determinants of Porter model are important in achieving a competitive advantage, but on different levels. For example, Deniz et al. (2013) aimed to determine the competitiveness of manufacturing firms operating in the TRB1 region, including Malatya, Elazığ, Bingöl and Tunceli. All the model's factors were evaluated as important. Demand conditions, and related and supporting industries were viewed as the most important ones for competitiveness and factor conditions were found to be the least important factor. Although sufficient capacity for exporting exists, migration of experienced workers to the western part of the country and the shortage of knowledge and qualifications of employees are barriers to developing international trade. The study recommended compensating this shortage by establishing training programmes sponsored by non-profit institutions. In addition, they concluded that advanced factors are the real determinants of competitiveness, which coincide with the results.

Bakan and Dogan (2012) were able to evaluate PDM and measure them in ranking order. The study was conducted on the four most important industries in Kahramanmaras (the textile, food, metal kitchen equipment and jewellery) and their competitiveness was analysed separately. Results obtained from quantitative analysis shows that from each of the sectors, demand condition affect the sectors competitiveness more than any other factor, followed by government and related industries. It is interesting to note, even though not surprising that, factor input condition appears at the bottom because competitive advantage is gained by the firms. This finding supports Porter's (1998) assertion that factor condition is not the driver for the current patterns of competitiveness as claimed by traditional economic theorist, but also points to how improvements can be done in the other factors as they appear on the scale.

A study was conducted to identify the market supply chain distribution in the Eritrean fishery sector (Teweldemedhin, 2006). Compared to this thesis that focused on all aspects of Libyan fishery, Teweldemedhin (2006) focused on only one aspect of the fishing industry. The study concluded that Eritrea's comparative advantage has never been converted to competitive advantage (e.g. the Red sea fish potential is being underexploited). In contrast to Porter's (1990) assertion that physical resources, as part of a larger factor conditions, may promote national competitiveness through sustained national productivity. Eritrea's fish productivity, even though underutilised, is declining as a result of dearth in fishing equipment, finance, culture of fish consumption, illegal catch and smuggling to neighbouring countries.

Porter's model could also be an effective tool in the detection of the strengths and weaknesses of the industry or the economy. For example, Cini and Nater (2009) state that after the Yugoslav wars, industries in the Croatian county of Osijek-Baranja lost almost 60 per cent of its production capacity. In addition, its previous markets in formerYugoslavia were closed down and it became indifferent to young peoples' need for technical science, which resulted in a brain drain. Therefore, it was impossible for it to compete internationally. However, there has been a great opportunity for reindustrialisation, using European Union funding, following Croatia's signing of a stabilisation agreement. Through the application of Porter's model, researchers were able to identify the strengths and weaknesses as well as threats that the industry faces in Osijek-Baranja County. In addition, it shows the existence of opportunities which might have been generated by economic well-being in the region. The study emphasised that there is a requirement to support existing food and agricultural resources, metal, wood and other products that could be developed through updating production. Chobanyan and Leigh (2006) drew a strategy for the Armenian economy by applying the diamond model. They emphasised that the PDM provides a useful basis for the selection of appropriate policies to enhance competitiveness. It is important to have medium - and - long-term economic plans if productivity is to be increased; the upgrading of the national diamond will ensure the continuation of sustainable development. Similarly, Porter's model was used to identify another potential contributor to competitiveness namely, global sourcing which was particularly observed in Thailand - an exporter of tuna to both Japan and the USA. Doing business with these two countries which are former producers of tuna, has provided Thailand with an opportunity to hone their capacity for doing business with an emerging market, take advantage of competencies and resources that are still scarce in the country, develop a differentiated supply/vendor system and boost their total supply capacity.

In a recent study, Khanani (2014) used PDM to compare the competitiveness of the oil and gas industry in Canada and Norway. Specifically, his study sought to establish what Canada could learn from Norway in regards to developing its oil and gas sector. Using interviews as the primary method of data collection, the study sought the views of a total of 38 professionals from the oil and gas sectors of the two countries. By using Porter's Diamond model as framework for their investigation, they established that Canada's oil and gas sector hold a promise of competitiveness, largely pivoting around the country's significant oil reserves, and the efficiency of the supply markets in reaching international markets which has evolved out of innovative responses to the complexity and harshness of the operating conditions. However, they warned that this promise of competitiveness may not be realised for a number of reasons.

First, the sector's heavy reliance on US as the 'sole' market for their products noting that 99% of Canada's exports and 88% of their total oil production was channelled to the US markets. Their call for the diversification of Canada's oil exports is based on the fact that the US oil imports is expected to significantly decrease over the next decade because the country's (US) own oil production is expected to significantly rise, possibly overtaking that of Canada especially in unconventional production. Secondly, in comparison to Norway's sector which enjoyed support from the government including funding and tax incentives, a more expert oriented licencing process (instead of bidding as in the case of Canada), supportive immigration laws and improved infrastructure (facilitating access to markets), Canada's oil and gas sector suffered from draw backs like a low capacity in innovation, significant labour shortage and limited access to capital. This was primarily linked to less supportive government policies including legislation amongst other things, which have minimised collaboration in the sector and failed to facilitate the sector's access to much needed capital. The third and final key reason which may be linked to the less supportive government policies is the general perception of the Canadian citizens towards the country gas and oil sector. It was noted that unlike the Norway's oil sector which is viewed favourably by the general population, Canada's sector did not enjoy as much. The key recommendation from the study calls for the need by the sector to invest in public relations campaign to project the image of Canadian oil and gas industry. In sum, the study underscores that given the significant oil reserves in Canada and the gains it has made in its supply sector in reaching the international sector, the country's prospects in the oil industry was still huge. Notwithstanding, they contend that failure to address public concerns raised in the preceding will adversely jeopardise those prospects especially in relation to shaping the industry as a value adding sector. Unlike Canada that has benefitted from its oil resources and has advanced economy, Libya, as earlier stated in chapter two, struggles to use its oil resources for development and has not made meaningful contribution to the survival of other sectors.

The aspect of competitive advantage as exemplified in Porter's model has also found relevance in policy making. This is particularly so because policy makers are generally expected to develop policies that would support a nation's competitive advantage. Specifically, they are expected to take into cognisance, their states, competitive advantages, and help identify the resources that can support it and public initiatives that can't sustain the competitiveness (Kaufman, 1994). The United Kingdom is one such country that has widely employed Porter's model in its policy making. Tapping into the Porter's notion of 'clusters', the country developed a cluster based policy as a way of spurring regional and national competitiveness. The original industry based clusters created in 1998 were initially set up at regional level and were under regional development agencies (RDAs), local authorities and other public agencies. This later evolved given the country's shift from industry based to a knowledge based economy, and resulted into setting, for example, a Biotechnology Clusters team which recommended the need for setting up 'incubators' and shaping of effective networks. This led to the creation of a new Cluster's Policy steering group in 1999 at ministerial level. In their quest to develop policies that would encourage cluster's growth, established 154 clusters, spanning the service and manufacturing industries and covering wide range of technologies. The Clusters Policy Steering Group gave way to regional cluster strategies in 2003. The regional clusters strategies were again put under the RDA's and at the national level the strategy was steered by what was called the RDA Cluster Sub-group consisting of representatives from all the RDAs and the Department of Trade and Industry.

The new formed regional cluster's group, using a practical guide on cluster development by their predecessors, took forward a number of the already formed clusters, key amongst them being motorsports, biotechnology and food and drink. A key focus was put on food and drink, which at that time was considered a significant contributor to the nation's competitiveness. The specific strategic actions that were taken to enhance the food and drink sector included, provision of capital for expansion of the sector, improving the supply chain capacity, addressing infrastructural concerns like shortages of premises, supporting export initiatives and increasing access for training and development. Part of this policy actions were based on Porter's 2003 assessment findings that pointed the country towards competition based on more unique and innovative products rather than competing on low input costs (Local Government Association UK, 2012).

Contributing to the discussion on Porter's model in influencing policy, Bruce and Pitts (1998) in their book *Competitiveness Food Industry,* emphasised the fact that there was a dialectical relationship between government policy and a nation's global competitiveness, thus presenting a need for cooperation between policy makers and industry players. The case of their argument for a dialectical relationship and the need for increased attention to the linkage between public policy and competitiveness, they contend was best exemplified by the 1990's competitive pressures seen in food markets in the European market that came about as a result of both trade and agricultural reforms at both international and EU levels. This means that the findings emerging from the use of PDM in this research can inform the initiation of policies that will shape fisheries as a value adding sector to Libyan economy.

One of the limitations of the application of Porter model in the food industry is that it has not taking into account the factors that influence eating or choice of food behaviour. Consumer food choice is becoming more complex than it was in the last five decades – they come with dynamic, complex and differentiated demands that keep changing the market. These changes in consumer food behaviour provide both threats and opportunities which the fishing industry in particular has to grapple with in their pursuit of competitive advantage. As a remedy, Shepherd model was applied to understand food choice and fish consumption and relate the findings to Porter's diamond model in Libyan context. The following section reviews consumer food choice and assesses Shepherd's model and its applicability in Libyan fish consumption behaviour. Findings from this model are contextualised in relation to demand factors of PDM.

5.3 Consumer Food Choices and Shepherd's Model

Food consumption behaviour of the people in MENA region has changed dramatically in recent times, as a result of rapid rise in the standard of living conditions due to increase in income from oil revenue (Musaiger, 1993). The impact of these changes on fish consumption in Libya is poorly defined and understood. The shortage of literature that explore the factors influencing Libyan fish consumption habit makes it even more difficult to identify any review that addresses factors affecting fish consumption using the Shepherd's food consumption model. Thus, consumption habits and preferences of Libyans (as consumers) for fish food were evaluated – that is, by identifying the different drivers in fish consumption in attempting to provide insight into the sophistication of demand for fish in Libya – drawing from the case study locations perspective. It is important to note that the decision whether, how much, and what type of fish to eat are influenced by many factors such as economic and market considerations (e.g., cost and availability). This is not neglecting the role that age, taste, gender, cultural tradition, access to alternative foods, health/nutrition and convenience play in consumption behaviour (Myrland et al., 2000; Olsen, 2004). What plays a prominent role in the consumption behaviour of fish food in the Libyan context is unfolded using Shepherd's food consumption model. The findings are contained in chapter 7-9. This section, therefore, pays attention to the factors that influence consumer choice. As attested to by Porter (1998:285): "the most important influence of home demand on competitive advantage is through the mix and character of home buyer need". It means that, to capture home buyer needs, each of the factors mentioned by Shepherd was taken into account in the design and gathering of data.

There are economic and non-economic approaches developed by researchers in an attempt to explain consumer behaviour. While the economic explanation is based on the assumptions that a rational consumer strive to derive maximum satisfaction from goods and services with the least price, non-economist examines factors surrounding consumer rational behaviour. The early models developed by economists seeking to recognise an economic system involve the study of how to allocate limited resources for unlimited needs (Antonides and Raaij, 1998). Attempts have been made to illustrate consumer behaviour in a comprehensive diagram (Zaltman et al., 1973). For example, Nicosia's model, produced in 1966, contains four parts: field one: from the sources of a message to the consumer`s attitude; field two: the search for, and evaluation of means - end evaluation of means-end(s) relation(s) (pre-action field); field three: the act of purchase; field four: the feedback. In addition, the Howard and Sheth (1969) model called, the theory of buyer behaviour, was more accurate and detailed than models which preceded it. The limitation of this model is that some variables are difficult to measure, yet others are not well-defined. In 1968, the Engel-Blackwell-Miniard model was developed by

Engel, Kollat and Blackwell, as a comprehensive model which included different sets of factors that are involved in the consumer's final decision (Loudon and Bitta, 1993). Subsequently, many theoretical and empirical models (such as, the concept of utility, axioms of preferences, theory of choice) emerged to measure general consumption behaviour.

Food choice is a complex phenomenon that involves various influential factors. The various attempts made to illustrate how and why people choose the foods that constitute their diets or about how their choices can be influenced in an effective way have resulted in many food choice models from different perspectives. There are three key factors that connect many of the models: 1) the food itself, 2) the individual at the centre and 3) the environment in which the interaction takes place (Booth and Shepherd, 1988; Khan, 1981). For example, Pilgrim (1957) posited that one's judgement to the sensory characteristic of foods is affected by the interaction between the individual psychological factors and external factors. Khan's (1981) model emphasised the nutritional impact of food based on patterns and preferences. Randall and Sanjur (1981) presented a model that measures the relationship between food preferences and consumption taking into account the food itself, the individual and their physical environment. These authors arrived at a conclusion that food preferences determine consumption based on an empirical analysis of 120 samples drawn from New York women to understand their preferences and consumption of 20 types of vegetables. Differences exist between the models: for example, while Pilgrim (1957) view food choice as being dynamic, Khan (1981) assumed that the factors are deterministic.

In order to conceptualise all the previous models, Shepherd's model (1985), which was first published in 1985 in Nutrition and Food Science journal with reference to Dietary Salt Intake and later reviewed by Shepherd (1989), developed the model which categorised factors influencing food choices as related to (1) food: its physical properties and nutritional value; (2) the individual/person making the choice: his/her previous experience, attitude, mood and learning associated with foods, which in turn will lead to different beliefs, values and habits; and (3) the external socio-economic environment: attitudes to sensory properties of food or healthiness of food, culture, religion. The grouped factors influencing food choice and intake are summarised in Figure 5.4.

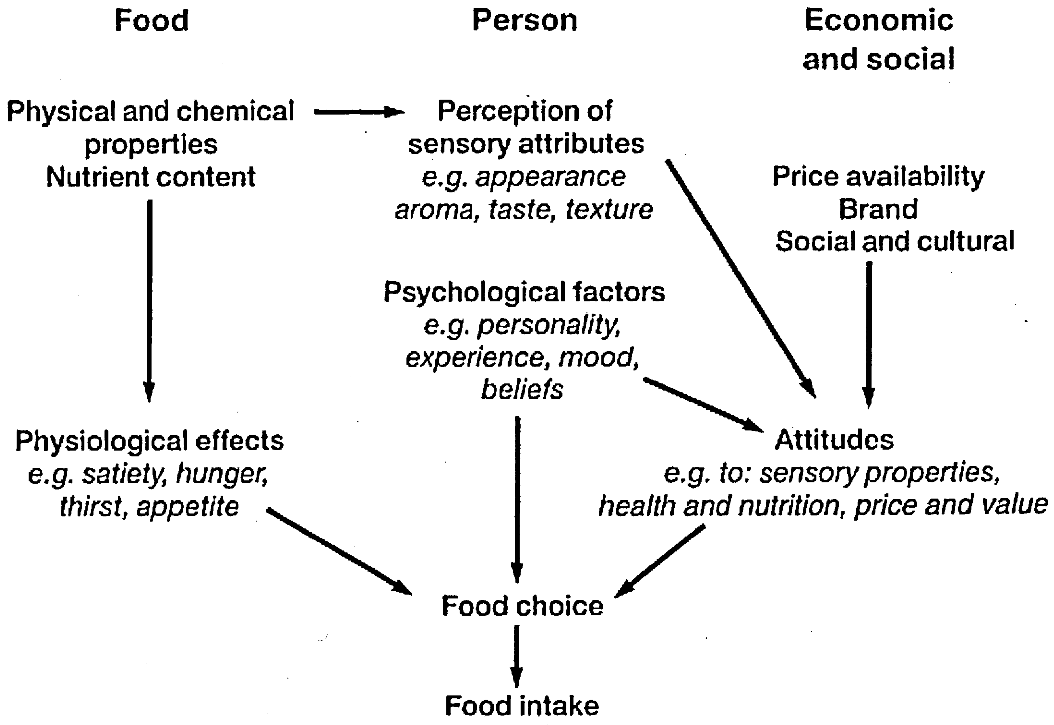
Food
Person
Economic and social
Physical and chemical properties
Nutrient content
Perception of sensory attributes
e.g. appearance aroma, taste, texture
Price availability
Brand
Social and cultural
Psychological factors
e.g. personality, experience, mood, beliefs
Physiological effects
e.g. satiety, hunger, thirst, appetite
Attitudes
e.g. to: sensory properties, health and nutrition, price and value
Food choice
Food intake

Figure 5.4: Factors influencing food choice. Source: Shepherd (1985).

Another recent example of food choice model that is similar to Shepherd (1985) was developed by Furst et al. (1996) and was based on a qualitative study. The model is made up of three main components :(1) individual experience in life, (2) key factors affecting the individual's choice of food, and (3) the individual developed schema for making food choice (Roininen, 2001). The same group that did the Furst et al. (1996) model, republished a paper in 2009 with a refined model called, food choice process model, to expand on the three components mentioned above (see, Sobal and Bisogni, 2009). There are other numerous literatures which deal with the choice of food, but this thesis does not intend to elaborate on them and must refer, for instance to Ritson and Hutchins (1995:43), Marshall, (1995), Krebs-Smith and Kantor (2001and French (2003). However, such models are either simplifying the influences that make people choose the food they eat or attempts to enumerate on the explanatory power of previous models. As was said earlier on by Shepherd, they in most cases remain qualitative and do not quantify the relative importance of factors. While recognising the impact of economic factors and the availability of food product, most models of food choice focus on the interaction between food products and the individual (Marshall, 1995). In this thesis, the

Shepherd (1985) model in particular, points to the variables to consider in quantifying food (fish) choice behaviour. The relative importance of the different factors influencing fish-food choice was determined by analysing relationships between the three broad factors, to understand the overriding aspects influencing fish consumption and those that act as pre-cursors of perceived low fish demand.

The goal of applying Shepherd's model was to provide a better understanding of fish consumption behaviour of Libyans and how that impedes or would subsequently lead to the growth of the fishing industry and make the industry competitive. It would be recalled that Libyans consume the lowest amounts of fish and seafood in comparison with their neighbouring Maghreb countries (such as Tunisia, Morocco and Algeria) bordering the Mediterranean (Sabrina, 2007). The use of Shepherd's model points to the variables that limit fish consumption and those that could influence domestic demand, including the sustainability of fish as a food source and its importance to national food security, well-being and economic growth. For example, whilst the Libyan fishing industry is full of potential, the economic viability of the industry depends on the supply and maintenance of adequate fishing stocks, upgrading product quality and improving marketing. Similarly, the fishing industry in Libya appears to have a bright future but the present capacity is not competitive to grow local demand, to compete with other foreign fish foods, to be developed in a sustainable and prudent manner, and to contribute significantly to Libya's economic diversification. In particular, Porter (1998) stressed that domestic demand is very important in the development of industry and in achieving a competitive advantage. Similarly, Porter (1990:562) opined that in the process of national economic development, "the nation's history, the prevailing values and norms of behaviour, the needs, tastes and preferences underpin demand patterns..." Given the complexities of consumer behaviours and society highlighted in this section, it is almost impossible to discuss all the factors that influence fish consumption or to isolate each factor without referring to other pertinent factors. In the next two sections, the factors identified by Shepherd (1989) are used in an attempt to simply identify the major factors, which have influenced the trends. Whilst the model has covered the overarching factors that determine food consumption in general, sections 5.3.1 and 5.3.2 also contains review of some studies on the factors that have influenced fish demand and consumption patterns under Shepherd's categorisation.

5.3.1 Related economic and social factors

1) Economic Influences

It is difficult to ignore the impact of economic factors in many aspects of living, especially among the things which enable the consumer to choose and to trade-off between several choices. Through demand theory, we know of the impact of price on quantity. However, the degree of effect differs as the price elasticity of demand varies from one commodity to another depending on the type of goods involved. In addition, income changes can impact on pattern of food. Studies on the impact of price and income on food selection and consumption have attracted the attention of a number of researchers for a long time. Price can be used as an effective tool to influence an individual's food choices. The strategy to reduce prices has significant impact on food choice and reducing prices effectively encourages the selection and purchase of healthy eating (French, 2003). French, et al. (2001) investigated the role of price in food choices for the consumer and indicated that price has a significance impact on food choice for all income groups, as noted by increased spending on food with an increase in income (see, also Leather, 1995; Ye, 1996). They also point to the significant increase in consumption of certain type of products such as fruits, vegetables, meat, fish, eggs, cheese and fresh milk, unlike other products where the level of consumption remains stable, for example, sugar, jam, bread, potatoes and flour. However, the level of consumption is shown to decrease in products such as condensed milk. According to Jensen (2006), income influences food choice, and with increasing income, people purchase more food, particularly those with high nutrition such as fish.

A substantial increase in income occurred in the Arab countries from the late 1970s to date, which resulted in a significant change in food consumption patterns. As indicated in section 3.3, revenues earned from oil-export in Libya have led to dramatic increase in per capita income. Income level of household head is a major determinant of food and fish demand. However, due to the disparity in the distribution of income, fish is perceived to be an expensive commodity due to high price. The high price can be attributed to limited availability and insufficient fish market, quality and poor distribution channel. In the coastal region where fish represent an important part of the local diet, price is not necessarily the determinant – other non-economic factors may play be accountable for low fish consumption, but with upgraded storage facilities and improved distribution, fish consumption will become more acceptable to Libyans. There is also a correlation between family size and expenditure on food. Knowledge of the income of the consumer and food prices may help in the identification of the impact on food choices and thus consumption. According to Ritson and Hutchins (1995), the ability to obtain numerical estimates of the price of food and consumer income helps the selection of food to be understood as it allows one to know the variability of consumption patterns depending on the change in the price of the commodity, as well as income. Increasing population and the need for food security and self-sufficiency, suggest that fish demand will continue to rise. Findings in chapter eight indicate that fish consumption is growing due to increasing awareness of the nutritional and health benefits of fish diet.

Geographical location and accessibility to fish markets and shops is considered as an important physical factor influencing food choice (e.g. Dibsdall et al., 2003). There are studies which indicate that the location of the region, in terms of distance or proximity to the sea impacts on the amount of fish people eat (such as, Foster, 2005), This submission is not necessarily the case in Libya (considering the length of the country's coastline and fish consumption). Similarly, the location of Britain does not make them enthusiastic fish-eaters compared to some mainland European countries. According to Foster (2005), Icelanders consume more than 90 kg/per year, the Portuguese 60 kg and Spanish about 40 kg, but in Britain, average consumption is about 8 kg/year. Thus, the factors affecting consumer behaviour varies depending on the location. For example, internal factors affecting the behaviour of the region's population are the price, distance from the coast, taste, quality and seasons of the year. As for the coastal regions, the factors affecting consumption are the quality, age, family size and number of employees in the family (Bose and Brown, 2000). This indicates that demographic factors, religion, ethnicity and location have an impact on fish consumption choices.

2) Socio-Cultural Influences

Dietary habits are an intrinsic part of culture and contribute effectively to consumer decision-making where there are many intertwined factors that affect consumer choice. In addition to physiological factors and the need for food, there are cultural and social factors which have a strong influence on consumer behaviour (Shepherd, 1999). Food is used to enhance family unity when its members eat together. Food may denote regional, ethnic and national identity (ASP, 1999). It is not easy to change many dietary habits such as eating patterns, method of food preparation and number of meals, even though there might be good reason for dietary change (Shepherd, 1999). However, according to ASP (1999), citing Kittler and Sucher (1989); Jerome (1982), Lowenberg et al. (1968), Senauer et al. (1991), held that although food habits and culture are unchanging, it is now beginning to be acknowledged that there are several factors affecting these habits, such as immigration and socio-economic environment. Customs and traditions, no doubt as a part of the culture of the community, have a strong impact on the selection of food. Shepherd (1999) states that the culture of the community have effect on the views of individuals in terms choice of food. According to Grivetti (1997), cultural and religious beliefs have a profound impact on the food selection that even in difficult circumstances people try to avoid foods from the point of view of their beliefs. What is extremely well-regarded in one nation may be seen unacceptable in another community. Food preparation, processing, foods chosen and particular meals at given social occasions are representative of a national or social group.

Local customs and traditions have an impact on food preferences in Libya. In some tribes, there is a cultural perspective on fish-eating, where fish is not considered a main meal. Generally, Libyans have preference to red meat, in particular, lamb meat despite its price that is higher to other types of meat and fish. Unlike Libya, fish consumption is higher in Oman, Qatar, the United Arab Emirates (UAE), Bahrain, Egypt southern Yemen (Feidi, 1986). The questions are: what is the place of fish in Libyan culture and traditions and how can fish be marketed to increase demand vis-a-vis consumption? These answers and other related factors can be found in section 8.2.2. An 'information gap' is clearly a major constraint that needs to be addressed. In places like Malaysia and Bangladesh, the consumption of fish is popular among all ethnic groups (Ahmed, 2011). That is probably why the average consumption of fish in Malaysia is one of the biggest in the world, where it reached 56 kg/per person in 2010 (Asia News Network, 2014). Apart from increasing income and health awareness, cultural factors contribute significantly to the impact on consumer habits, and knowledge of consumer behaviour can help promoters in marketing campaigns. For example, Ahmed (2011) examined the factors that influence the purchasing decisions of consumers from the Malaysian fisheries and concluded that, the most important factors influencing the decision to buy fish are socio-cultural: family size, education, religion, gender, location and ethnic group. In Norway, for example, the presence of school-age children and price are barriers to seafood consumption (Myrland et al., 2000). The authors also showed that consumption of seafood increases with increasing family size and educational level. In addition, they pointed out that suppliers can increase the value of their sales through marketing high quality products which satisfy consumers with higher education, while families with children tend to buy fish products with added value. Collins (1999) suggested that performance of the fish industry can be enhanced by the Supply Chain Management (SCM) principles.

5.3.2 Factors Related to the Person

1) Perception of Sensory Attributes

Sensory properties, which include taste and flavour, are of such importance that it may be a major determinant for the selection of a product or aversion to it. Marshall (1995) cited in the International Organization for Standardization ISO (1994), stated that "sensory preference is an expression of the emotional state or reaction of an assessor which leads him/her to find one product better than another or several others". In addition, Schmidt and Benson (2009) state that the *taste* of food is actually *flavour*, which mostly results from the interaction between smell and the sense of taste. There are many studies that show the importance of sensory attributes such as taste, smell and others that influence the consumer when choosing food. Raats et al. (1995) suggest that food taste has a very important role in determining the admissibility of food for many consumers.

Furthermore, Schmidt and Benson (2009) citing the International Food Information Council (IFIC) (2009), states that the taste of food is the most significant factor in the selection of food that affects the consumer. The consumer may also avoid buying foods that are not to his or her taste, even though the prices are low. Sensory attributes play an important role in food choice and acceptance for the consumer where there is relationship between the sensory attributes of food and food choice. Clarke (1998) gathered evidence that points to the fact that sensory properties of food in flavour and taste have a very particular effect on the selection of food by consumers. An earlier study by Steiner (1979) showed that personal preferences have a significant impact upon food choices through taste and nutrition. It is also known that there is a difference in people's tastes in terms of their preference for a particular type of food or products compared to the others. There is also a difference in the degree of importance of taste of food compared to other factors affecting the choice of food. A study on wives and husbands found that nutrition ranks first, followed by taste from the perspective of wives, while from the husband's perspective, taste ranks first followed by nutrition (Schafer, 1978 in Raats et al., 1995). With regard to sensory influence on food choice, this study focuses on fish. In terms of quality, Libyans want to have a fish that is fresh and comes with shiny skin. Because of poor distribution channel and not developed food-chain, all the procedures for receiving the freshest fish are lacking. If a customer wants fresh fish, he has to go to the fish markets close to the harbour (see section 10.2.2). Often the fish that comes to final consumers are poorly packaged; thus accounting for low quality and bad smell. Taste-preferences towards fish are also important predictors of fish consumption behaviour. Findings in chapter eight show that the aroma and taste are deterrent to fish consumption. While some families totally dislike the odour of fish, others prefer fish that do not have a fishy taste, thus raising questions about improving the quality of preparation to make fish less smelly. Similarly, the taste differs from what they are used to (e.g. lamb or chicken).

2) Influences of Psychological Factors on Food Choice

Many studies found out that psychological factors have an effect on food choices (e.g. Zielinska, 2006). Through his model, Shepherd (1985) indicates that there is a relationship between psychological factors (e.g. personality, experience, beliefs) and the decision taken by the consumer on food selection. According to Shepherd and Raats (2006), consumers often attribute present eating patterns to previous experiences. In addition, people evolve and change over their lifetime and -depending on environment and personal constructs - these changes also include attitudes toward food, where food choices evolve over time. Furthermore, mood also has an effect on food choice. Gibson (2006) claimed that mood "is typically characterised as a psychological arousal state lasting at least several minutes and usually longer, with dimensions related to energy, tension and pleasure" (Gibson, 2006:54). There is no doubt that food choice and mood interact with each other; changes in mood affect the choice of food in the future (Gibson, 2006). According to Zielińska (1999 in Zielińska, 2006), one food choice motivation is that of obtaining comfort after eating. Drinking and eating have a significant impact on mood and cognitive performance. The most common way in which food can influence behaviour is the change in mood that occurs from before to after eating a meal (Gibson, 2006). In addition, it is evident that convenience has a prominent role in the choice of food; customer demand for convenience foods is nowadays on the rise around the world (Wales, 2009). In particular, studies have investigated the role of convenience and its relationship with the preparation of meal and consumption (Candel, 2001; Costa et al., 2007; Boer et al., 2004).

The influences on choice of food seem to be mediated by attitudes and beliefs held by a person. Romano and Fjermestad (2006) citied Ajzen's (2001:28) view that attitude is a "summary of evaluation of a psychological object captured in such attribute dimensions as good-bad, harmful–beneficial, pleasant, unpleasant, and likable-dislikable". Beliefs about health and quality of nutrition may be stronger than real health information on health and nutrition, as well as social and economic factors, cultural, religious and demographic, which are expressed in the end, in the form of attitudes and beliefs towards food (Shepherd, 2001; Raats, 1996). How psychological factors such as convenience, experience and beliefs play a vital role in the behaviour of Libyan consumer to fish is covered in section 8.2.2. For example, fish may require preparation prior to cooking, and both fresh and minimally processed fish have relatively short storage lifespan compared to lamb, beef or chicken. Respondents perceive the whole process of preparing fish menu as requiring more time over less perishable sources of protein. Other psychological aspect found relevant in Libyan context includes experience, health beliefs about fish and whether or not fish consumption is linked to stress management or mood.

5.4 Summary

This chapter has reviewed literature relating to theoretical and conceptual framework relating to ways of understanding and measuring national competitive advantage. The chapter was organised into three main parts. The first part considered the timeline of economic theories, starting from classical economic theories of growth through to modern economic theories of comparative advantages, and finally the competitive advantage theory. This theory provided a guide for answering the extremely difficult question inherent in country's firms, industries or sectors capacity to be productive. Competitive advantage of nations theory argue that national prosperity is created, not inherited and growth does not squarely lie on country's natural endowments, as classical economics insists. A nation's competitiveness, according to Michael Porter (the founder of the theory), depends on the capacity of its industry to innovate and upgrade.

The second part focused on Porters diamond model – a framework that can be used to analyse the determinants of competitiveness of a nation or industries. The assumptions of the diamond strategy can be summarised as follows: firstly, a nation's competitiveness depends on the capacity of its industry to innovate and upgrade, which means creating and sustaining superior performance. Secondly, there are four determinants: factor conditions; demand conditions; related and supporting industries; and strategy, structure and nature of competition. In addition, there are two assisting determinants: the role of government and chance. The diamond is based on these key determinants that could be compared, contrasted, and assessed to determine national competitive advantage. Anticipated outcomes of the theory are: stimulation of local competition; the creation and development of industries around the core industry; stimulation of local and international demand; and the introduction, improvement and development of technology.

The preceding discussions on the applications of Porter's model across many industries in many countries affirm the fact that the fundamental measure of competitiveness according to Porter's diamond model is productivity. Accordingly the rich oil countries inability to adequately compete can be attributed to the fact that their reliance on oil has led to the stagnation of potential productive industries and sectors.

The synthesis on the research on application of Porter's model across a number of industries also confirms that the Diamond model is a powerful strategy for carrying out a SWOT analysis of any industry and thus can be employed by policy makers in making sound decisions. These notwithstanding, it is clear that there is not a consensus on all aspects of Porter's model; Porter's position on the role of the government for one, has elicited some debate with some researchers strongly arguing for a direct role of the government. The other aspect that has attracted some controversy is the importance of the determinant of the diamonds in an industry's competitiveness. Some of the researchers have maintained that some industries can attain competitiveness without having all of the determinants as proposed by Porter.

Key to my study though, is the fact that the preceding discussions, offer considerable evidence of the successful use of Porter's model by many developing countries in evaluating the strengths and weakness of their agricultural sector, oil and gas sector and even general policy making.

In the case of this research, the fisheries sector in Libya has been chosen as it has the potential to support the oil sector and to take the first steps to achieve economic diversification. As the model has being widely used, application of PDM in various sectors and countries show general support and analytical potential from developing countries, not without some critiques. For example, PDM has not been widely used in the fishing industry and it is a sector that has been greatly influenced by food choice behaviour. These behavioural patterns and changes affect the sector's ability to satisfy local demand and attain competitive advantage. This thesis therefore, took advantage of the model to determine how the fishing industry could gain a competitive advantage. Since Porter's diamond model is limited in capturing food choice behaviour, the factors that affect food choice behaviour are captured using food consumption behaviour model.

Shepherd's (1989) model, which forms the third part, was used to understand home demand conditions of the Porter's model. Thus, consumption habits and preferences of Libyans (as consumers) for fish food were evaluated. Together, Porter's and Shepherd's models provide the research with a wide scope of knowledge and background to examine competitiveness of Libyan fisheries at this time of post-conflict economic reconstruction and prosperity. The focus on the fish industry is not an exception but an attempt on how the enormous potential of the industry can be exploited for diversification, productivity and national growth. It is expected that the outcome, following the combination of the above mentioned models, would provide the facts and database that enables Libya to move from lagging behind to creating competitive advantages. Hence, this study may be regarded as a pioneer study in the Libyan fishery context, addressing all the complex and diversified nature of the fishing industry rather than concentrating on industry perspective or by considering an aspect of the fishing industry structure like technology that cannot capture the comprehensive richness of the industry competition. The following chapter pulls together and discusses the fish value chain.

Chapter six

Aspects of Fisheries Sector and Value Chain

6.0 Introduction

This chapter contains some aspects of the business of catching, handling, trading and consumption of fish. These aspects of the business process are described as well as the requisite conditions that make it work and successful. The description draws significantly on related literature, respondents' comments and observations recorded during the fieldwork. A good understanding of the value chain will enable a better understanding of Porter's (1995) related and industry support factors, particularly downstream related industries, which fish and fishery products must pass through to reach consumers (e.g. distribution, handling and marketing). The remaining fundamental aspects of fisheries, such as fishermen and fish consumption, are not addressed in detail in this chapter because they have been examined elsewhere in the thesis. For fisheries to develop and perform at optimal level these value chain processes need to be enhanced and made operational even though they self-emerge in advanced economies. For example, Libyan fisheries authorities have made improvements in the areas of fish landing and processing plant but a lot needs to be done in other aspects of the value chain (see chapter eight).

The first section (6.1) contains more background information than primary research about value chain. Section 6.2 explains the different functions and actors involved in transforming fish to an article of consumption. Aspects of fisheries that are critical in unravelling the competitiveness of the sector include: place – distribution and strategies – (6.1), handling and processing (6.2), distribution and marketing channels (6.3) and lastly, the attention placed on sustainability of fisheries (6.8). Chapters 8, 9 and 10 contain the analysis of findings on these aspects of fisheries.

6.1. The General Value Chain Concept

The value chain simply describes all the activities and actors involved in bringing a product or service from the initial conception, through the different phases of production or processing/handling and distribution to final consumers and final disposal after use (Porter, 1985; Kaplinsky and Morris, 2000). Hempel (2010) added that each of the preceding steps and the steps that follow can be analysed to increase value and to gain any real competitive advantage. Porter (1998) confirm that competitive advantage cannot be understood by looking at the company as a whole, but it stems from the activities performed by the firm in design, producing, marketing, delivery and support its output where these activities could contribute to the development of the relative cost of the company and serve as a basis for differentiation. It is important at this point to differentiate between value chain and supply chain. On the one hand, value chain as explained above comprises the various processes that a product goes through and what the market will pay it considering the differences in market conditions and food behaviour and pattern of particular people. On the other hand, supply chain deals with cost of the product and how long it takes to present the product for sale. Supply chain in essence reduces the number of links and time a product takes to market. It means that a supply chain is an indispensable step towards developing a value chain. Figure 6.1 indicates Porter's suggestion for splitting value chain into 'primary' and 'support' activities. Primary activities in the value chain include inbound logistics, operations, outbound logistics, marketing and sells, and after-sales service. These activities are supported by procurement, technological development, human resource management, and infrastructure. However, van den Berg et al. (2009) have argued that value chain analysis can be viewed in a narrow perspective (see, figure 6.2) or broad sense (as contained in figure 6.3).

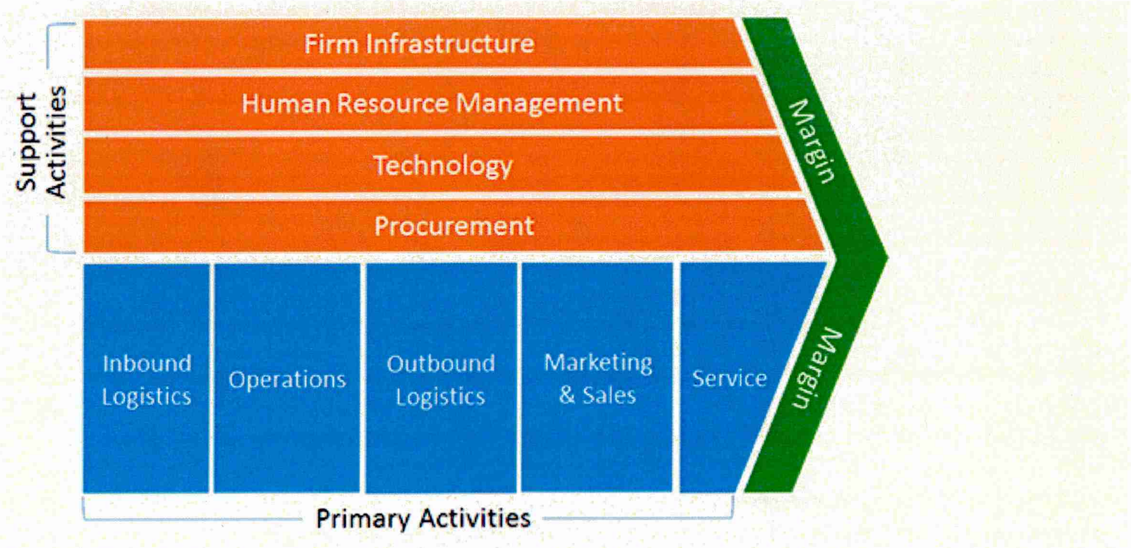
Support Activities
Firm Infrastructure
Human Resource Management
Technology
Procurement
Margin
Inbound Logistics
Operations
Outbound Logistics
Marketing & Sales
Service
Margin
Primary Activities

Figure 6.1: Porter's generic value chain.
Source: Porter (1998)

Primary activities:

- Inbound logistics: all activities related to the transfer, receiving, moving, storage and handling of material and component inputs, and ensure flow to meet the needs of production.
- Operations: all industrial and other activities for transforming inputs into outputs (goods and services).
- Outbound logistics: all activities and operations logistics that relates to the transfer of distribution, storage and output delivery.
- Marketing and sales: these activities relate to all marketing activities and the identification of customer needs and the generation of sales.
- Service: all activities associated with sales and after sales support services that the organisation offers, such as repairs, maintenance, and supply of spare parts.

The combination of the above activities is essential for organisations to develop the competitive advantage Porter argued for. There are other activities within each of the major activities that generate backward and forward linkages within the value chain.

Support activities are:

- Procurement - it includes the supply of raw materials at the best prices and the best quality as possible.
- The development of technology - it includes technology development to support the activities of the value chain for competitive advantage through the automation and research and design.
- Human Resources Management - human resource is very important, therefore activities, should linked with training, the development of education.
- Infrastructure of the institution and include administrative and planning structure and legal structure represented in laws and regulations, because this supports the activities and push the organization forward and when there is a strong infrastructure, it helps the institution to gain a superior competitive advantage.

6.2 Fisheries Value Chain

Fisheries involve a number of stakeholders in the supply chain ranging from the fisherman/fish farmer through wholesales to the final consumer. According De Silva (2011), value chain describes the activities that take place in fisheries and relates them to an analysis of the competitive strength of the business. In this case, De Silva (2011) suggested focusing on strategies that focus on those activities that enables fisheries to attain sustainable competitive advantage of the entire value chain and those involved at each stage (De Silva, 2011). Figure 6.2 shows a simplified fisheries value chain model that summarised hundreds of activities in the process of converting fish product into final product at the door-step of the consumer. Hempel's (2010) diagram seems simple and assumes that the processes involved are straight forward.

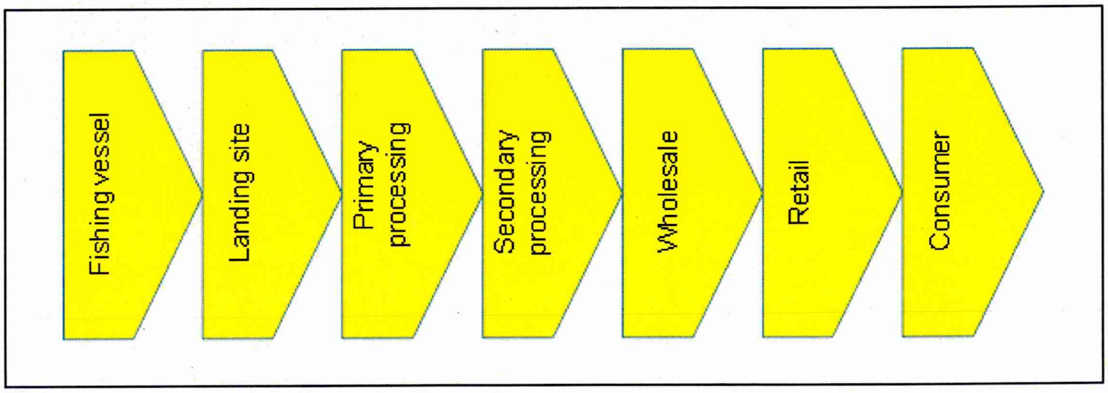

Figure 6.2: Simplified value chain in fishery sector.
Source: Hempel (2010)

However, the processes that related from the beginning to deliver the product to the final consumer are not as simply as explained in a series of value chain (fig 6.2), (Silva, 2011). These activities can be divided into activities related to production, activities related to distribution, and marketing-related activities.

Activities related to Production: it is the inputs of industry; the fishing industry need varied multiple inputs which include various boats, fishing gear, the ports infrastructure as well as transportation of inputs of production process from and to sites. There are also human resource inputs such as skilled fishermen and workers and their expertise in this craft, and all activities that deal with harvesting and processing. It is possible to assume that the firm begin to locate its competitive advantage from the rest of the companies; since the beginning of any upstream activities begin by exploiting the opportunities where firm start to impose and create its excellence on the market.

Activities related to downstream: the activities that deal with the outputs from core activities obtained. In the case of fisheries, these activities are those related to harvesting and sorting, transportation and processing, distribution to local market and export. There are many different activities in the landing sites and these activities vary according to the infrastructure at ports of fishing. In landing sites there may be services that compile, sort, classify and freeze fish for distribution to the markets.

Activities related to distribution: the distribution activities include all activities related to transportation.

There is no single method of applying value chain methodology; each process in the chain has particular characteristics. However an understanding of the broader issues involved allows for effective capturing of their distinctiveness. All the value chain processes are captured in the PDM determinants and are analysed and presented in chapter seven, eight and nine. The next sections (6.4-6.8) deal with processes of the fish value chain including sustainability pressures and supporting activities in figure 6.3.

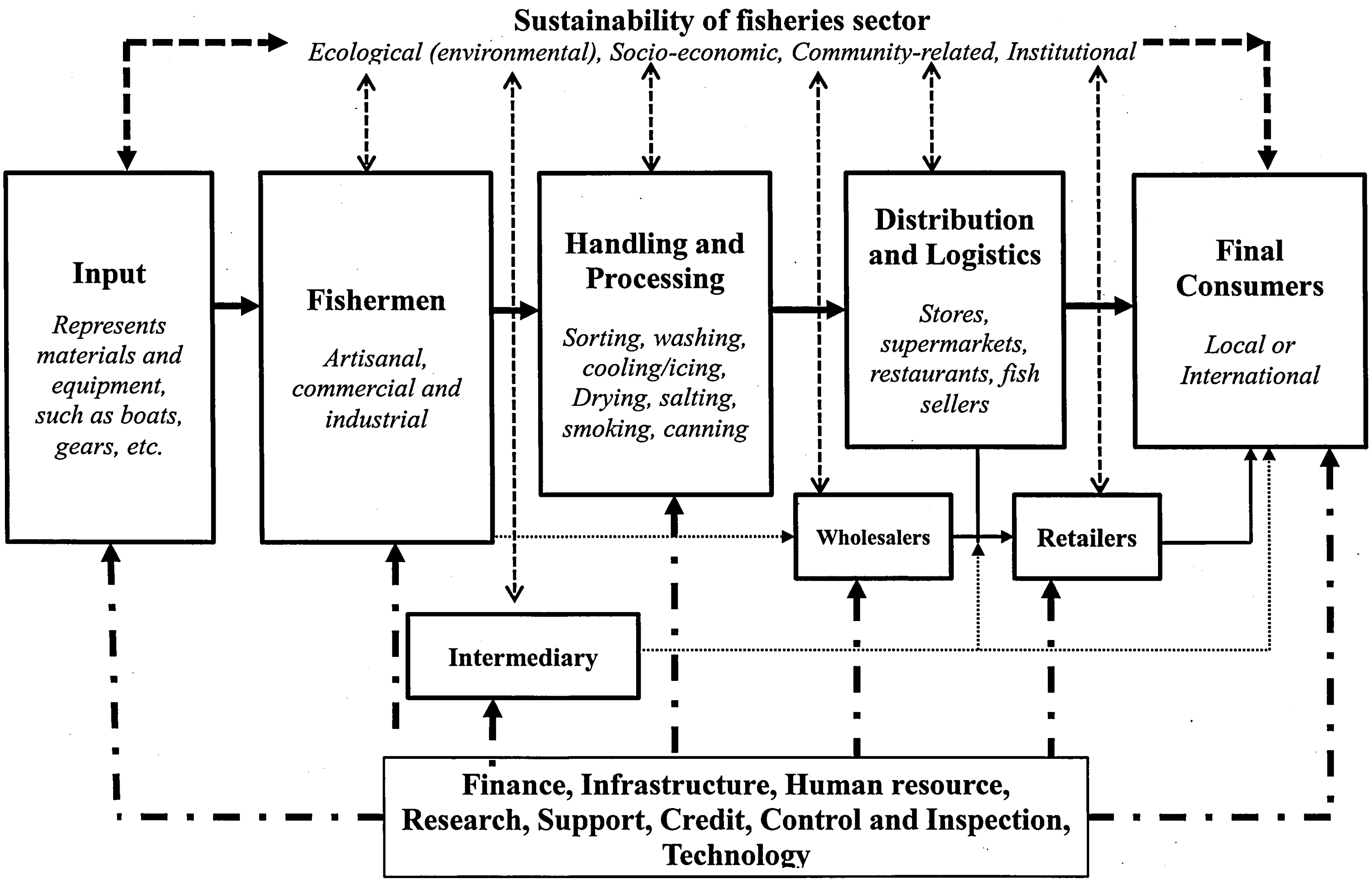
Sustainability of fisheries sector
Ecological (environmental), Socio-economic, Community-related, Institutional
Input
Represents materials and equipment, such as boats, gears, etc.
Fishermen
Artisanal, commercial and industrial
Handling and Processing
Sorting, washing, cooling/icing, Drying, salting, smoking, canning
Distribution and Logistics
Stores, supermarkets, restaurants, fish sellers
Final Consumers
Local or International
Wholesalers
Retailers
Intermediary
Finance, Infrastructure, Human resource, Research, Support, Credit, Control and Inspection, Technology

Figure 6.3: Fish value chain including sustainability pressures and supporting activities

6.3 Fishermen and Fish Farmers

The fishing industry, as indicated in section 1.6.2 and throughout the thesis, comprises artisanal and industrial fishermen. The fish value chain starts with the fishermen and fish farmers who make the harvest that is passed on to the rest of the value chain until it gets to the final consumer. On the one hand, industrial fishers have large scale of production and concern more on few economically important species (De Silva, 2011). On the other hand, artisanal fishers use traditional fishing equipment to catch fish for subsistence and the surplus is supplied to local markets. As can be seen in chapter eight and nine, the current state of fishing facilities at fish markets in the study are and to a large extent at fish markets of *BanKina souk* in Benghazi and small fish markets in other cities, are with poor hygiene and sanitation. The handling, washing, sorting, grading, cleaning and icing of fish are below standard practice. In later part of this thesis, evidences collected from fieldwork shows that ice, cold storage, transport facilities and distribution channels are generally unhygienic, dilapidated, inadequate, and in need of attention (see chapters eight and nine). While a few of the wholesalers, particularly those exporting the fish to Tunisia have better facilities, the general conditions of drainage, sanitation and management need improvement. For the fish product to gain some value as it passes through the chain, attention has to be first placed on all the above factor limitations and other determinants identified by Porter in order to make the sequence systematic and valuable.

6.4 Fish Handling and Processing

According to William (1996), the most effective way to contribute to food security is to improve efficiency and this can be done in many ways, including reducing losses after catch. Losses can be reduced by improving handling of the product. Fish handling is the backbone of the fishing industry because it keeps the quality of fish. Therefore, handling is usually a source of concern for stakeholders. Fishermen and traders are motivated to deliver high quality products of nutritional value to the consumer, which contributes to food security, as well as contributing to the GDP, and thus to overall economic development. Handling requires many things, both at the level of merchants and at the state level. For example, fish traders and others who deal with fish need to have a good level of knowledge in the ways to keep fish from contamination during processing, such as a focus on clean places that deal with the fish. This is not only in order to maintain the level of the prices and to reduce post-harvest losses as much as possible, but also to preserve the health of the fish, because fish pollution, especially eating polluted fish badly affects human health (FAO, 2001). In most developing countries, the handling process that assures consumers a good quality fish product is still traditional with little assistive technology. Whereas, in most developed countries, the HACCP (hazard analysis critical control point) system of WTO has been operational to maintain food safety and quality, such as fish (Huss, 2007).

There are several methods used to maintain the quality of fish during handling, such as freezing or chilling (using ice to lower the temperature), drying, salting and exposure to heat in the case of fish canning and smoking (Tawaari and Abowei, 2011). Fish should also be kept in and separated into boxes or baskets in a refrigerated temperature and protected from exposure to direct sunlight. According to Davies et al. (2008) in Tawaari and Abowei (2011), fish deteriorates quickly in the tropics and must be kept refrigerated to minimise microbial spoilage from poor sanitation, processing and storage conditions. As can be seen further (chapter eight), Libya like other developing countries are lacking such facilities, which makes post-harvest losses very high. Fish marketing, for example in Bangladesh, suffers from lack of means to transport ice and lack of roads as good conductors; these absences put farmers in a weak position and consequently intermediaries exploit the situation through an illogical pricing policy. This has caused resentment among fishermen, consumers and poor traders because the price of fish has risen above that which the consumer can afford (Alam et al., 2010). Fish marketing channels are usually similar in most developing countries in terms of the absence of the use of technology.

Together with proper handling, processing is used in preparing fish intended for either local markets (to sell to retailers or buyer) or for export. In some cases, the processed fish are from those rejected by exporters as poor grade or quality and those that are premature for consumption (Dubay et al., 2010). For example, De Silva (2011) reported that in Mexico, artisanal fishers and industrial producers' process and package shrimps for the export market, mainly the United States. Traditional methods of processing, such as hot smoking, sun-drying, and deep frying hinders entrance into the fish export market as they could not meet the SPS (Sanitary and Phyto-Sanitary) measures (Shamsuddoha, 2007). Poor maintenance of quality standards, as in the case of Libya, is hampering progress of Vietnam seafood industry despite their large potentials. Similarly, for processing plants to operate in the international market it must first be responsible for meeting national standards and those set by the international guidelines for exporting processed fish (De Silva, 2011).

6.5 Marketing Fish Channels (e.g. Wholesalers and Retailers)

The channels of fish distribution are an important element of the structure of the fish market; the difference between channels, in terms of the gradient or the disappearance of some rings, affects prices as well as the infrastructure of the market. This chain constitutes market structure. It also depends on the size of the market; large markets need a large number of dealers to perform the functions of the various markets while narrow and limited markets only need a small number of dealers. This, of course, affects the employment opportunities that are available in the market. Operators of these channels are: the fishermen, fish collectors, dealers, wholesale, retailers, other buyers, workers in the market and consumers. Fish marketing is a source of livelihood for many people in Africa, especially the poor. The local fish market contains many job opportunities in the form of fishermen, wholesale buyers, retailers, brokers, carriers and daily workers. The main objective of this series of occupations is to deliver fish to the consumer in the right place at the right time. Marketing and distribution channels are important characteristics in the process of getting the produce from source to consumers (Olubunmi and Bankole, 2012).

A market chain from fisherman or farmers to consumers passes through several intermediaries: local fish traders, agents, wholesalers and retailers. Wholesalers and distributors in the fish value chain buys and store products, and sell them to retailers, food vendors and restaurants, and fish processing companies. In general, fish catch from fishers is sold directly to various wholesale traders. Moses (1992) in Olubunmi and Bankole (2012) states that, a fish distribution channel is common to most developing countries with a series of middlemen between producers and consumers. Olaoye (2011) states that in Nigeria fish marketing and distributions are traditionally made through a number of market intermediaries. The marketing of fresh fish needs a network of stakeholders and beneficiaries to do the marketing; they are usually fishermen, middlemen such as wholesalers and retailers, processors and even up to consumers; this network constitutes a marketing channel. Systems involve the collection, processing and transportation of fish from fisher folk at remote landing areas to major consuming centres. Physical function is a series of activities that involves transportation, storage, handling and processing. In developed countries there is usually a system and a clear structure for marketing fish channels. For example, Yagi (2011) state that in fish markets in Japan, the domestic fish distribution channel consists of several layers of traders having two stages of wholesale markets. The two types of wholesale markets are: 1) landing site wholesale market and 2) consuming site wholesale market. Landing site wholesale market handles the landed fish and it includes the middlemen and distributors, whereas the consuming site wholesale market is a market located in cities like Tokyo and it includes the wholesalers and brokers.

In the developing countries, traditional retail outlets are commonly used for marketing fish than the use of supermarkets. Conversely, modern retail outlets such as supermarkets are used as retailers for fish in the developed country markets. According to Sehib (2013), Libya is recently witnessing the establishment and spread of modern retail outlets such as supermarkets and new stores in all the cities because they are safer, cleaner, and offer less crowded environment for consumer experience. For example, Sehib (2013:168) research about consumer shopping behaviour in Libya reported that social acceptability and freshness of produce are the pulling factors for buying fresh fish from supermarkets. Ardjosoediro and Goetz (2007) believe that the growing number of supermarkets in the developing countries signifies market opportunity that may persuade fishers, handlers or wholesalers to improve upon their fish products, cold chain and establish strong linkages with supermarket market outlets.

In the Libyan context, fish markets represent one of the smallest fish market places (Al-Arifi, 2008). Distribution and logistics play a significant role in marketing as addressed previously in the literature. These are considered tools that help in the delivery of the product to the final consumer, in good quality and at the right place, time and price. Wholesalers play a vital role in bringing fish from artisanal fishermen to export markets retailers or consumers. Still, some intermediaries buy catch directly from fishermen and sell them to processing plants or to restaurants. These intermediaries' enables artisanal fishermen to stay in business because there activities inject liquidity into the industry. However, the distribution channel is not clear and there is no government control to maintain the structure of the market. One of the objectives of the study is to examine the role of distribution and logistics services in local fish marketing in the eastern region of Libya. Based on the above, there is a need for effective distribution channels and logistics services to make the fish available to the consumer and ensure access to fish at a time and place suitable for the consumer, just as there is for other meat products, like chicken, lamb and beef. For example, an organised and direct access to the market could enable fishermen to earn higher profits. The extent of development and improvement of distribution methods and logistics services will provide good service to consumers and it will maintain the rights of producers and intermediaries, while appropriately profiting them. If this is not achieved, the fishing industry will not contribute effectively to the Libyan economy either in terms of food security or economic diversification. This means that there is an urgent need to develop strategies on each of the elements of place –both distribution and logistics – otherwise, the main objectives of maximising gross revenue and sustaining it over time through value chain management is jeopardised.

6.6 The Place (Distribution and Logistics) Strategies

Place has many meanings in marketing. Place in thesis refers to distribution and logistics of the product. According to Richardson and Ruth (2010:79): "Place is about marketing channels and distribution/logistics, and is just as important in a business-to-business market as it is in a business-to-consumer market". Marketing channels and distribution/logistics are fundamental to effective development in any industry. Some experts regard place as the basis of marketing. For example, Howcroft (1992) argues that distribution and logistics are a significant means for both efficiently transporting products and communicating resourcefully with the marketplace. Sullivan and Adcock (2002:76) define traditional retail marketing mix as "place, place, place and place". Distribution and logistics are important elements in marketing because of their direct and effective impact on the rest of the elements of the marketing mix. Distribution will be successful if a product reaches the customer with speed and it shortens the distance between the producer and the customer. Also, for it to reach the right place, the product must go through transport channels, which can be costly, in addition to the flow of service to the customers for the purpose of satisfying their needs and desires, at the right time and place with the appropriate quality and required quantity (see also Richardson and Ruth, 2010). Distribution is essential to ensure that products arrive to consumers through an organised network of warehouses, distributors and retailers (De Silva, 2011). Lancaster and Withey (2007) emphasised that place should be planned carefully because if place planning was bad, all efforts of the vendors— such as excellent products, good promotion campaigns and competitive prices—will be in vain. Many products and businesses have not been successful and have disappeared from the market due to poor distribution and logistics.

A number of researchers have explained the significance of distribution channels and logistics operations (place) of the product. In fact, there is a close relationship between logistics and distribution channels and the importance of each is complementary to the other. For example, marketing logistics is important because it includes organising and controlling all movement and storage operations connected with the flow of finished goods from the end of the production line to their satisfactory arrival in the market place, and of the associated channels of distribution required to arrange and complete the transactions between the company and its markets (Buxton, 1975). The channels of distribution and logistics operations are responsible for the success or failure of the marketing process. According to Dibb and Simkin (1997:127), the place element of the marketing mix concerns distribution issues such as the activities that make products or services available to customers and when and where they want to purchase them. Many products have proliferated and become renowned not for their valuable or high quality but because they are located in places close to the consumer thus ensuring ease of access and vice versa; difficulty of access to the goods and their presence in too few places, far from many consumers makes the consumer look for alternative products.

Logistics services that could be provided by business managers to the customers are many and variable. For instance, Gilmour et al. (1994) and Mentzer et al. (1989) in separate studies about logistics services and their relationship to the importance of customer service highlighted these factors, which are: availability, delivery quality and timeliness, conductivity, price, quality and warranty. The distribution of commodities is essential in our communities. Packaging makes it possible to distribute perishable foods, such as fish, over long distances and manage the supply of everyday commodities. Material developed for usage in industries is vital where the packed products need to have high moisture content and some vaporising through the packaging material during transportation from the filler to the supermarket. To Rundh (2005:670): "structural changes within the European food industry are reinforcing a need for competitiveness where packaging can make the difference for many consumer products". He argues that the importance of packaging and packaging design for fulfilling multi-functions in relation to logistics and marketing in the supply chain from filler to end consumer is underscored as shown by the findings from many case studies. He adds that innovative packaging solutions in retail outlets are required due to changes in consumption patterns and habits.

The use of several different distribution channels could provide better services to consumers based on their different needs (Logman, 1997). Ghosh et al. (2004) provided a list of seven items that dealt with the potential benefits that distributors expect from suppliers: 1) improving overall quality; 2) improving range of products; 3) increasing customer satisfaction; 4) offering more efficient customer service; 5) lowering total costs; 6) lowering prices; and 7) protecting investment in assets. Nordin's (2005), investigation on the most favourable product service distribution channel, emphasised the significance of product availability, information flow, an effective ordering process and effective delivery service to customers. The distributors of goods began to rethink their distribution strategies as a result of a long relationship with customers by focusing on marketing services which were aimed at consumer satisfaction (Goldsmith, 1999). Fish is a sensitive commodity which is quickly perishable. Thus, the ways to deal with it and market it is somewhat different from other non-perishable commodities. The quality of storage, marketing and other needed services will be the focus of the subsequent section which discusses the importance of place for the marketing of fish.

6.6.1 The Significance of Place (Distribution and Logistics) in Fish Marketing

Whilst enterprise or business aim at maintaining costs as low as possible for the total inventory, transport, communication, storage and materials handling, it is expected that fish produce is readily accessible to customers. Marketing is defined as "making it easy for people to buy" (Mackay and Wilmshurst, 2002:110). Fish is one of the most perishable of all foodstuffs and any method of retarding its deterioration – from proper handling, processing and distribution - is therefore of great economic importance (Rahman, 2007). Fish marketers have the following responsibilities in ensuring that fish is utilised in a cost effective and efficient manner: first, in maintaining the quality of fish using the right preservatives; and second, to market the fish at the right time and place for the consumers to derive maximum nutrients from their fish. This is because fish is highly sensitive to damage and thus can result in large wastage, considerable economic loss and a negative impact on the health of those eating damaged fish. However, the Libyan fisheries must be exploited efficiently to achieve the desired goals food security as well as economic diversification. In doing so, countries, such as Libya are expected to engage in rudimental plans that seek to improve and develop the logistics services to reach the level of international standards for the industry. For example, Williams (1996) states that to maximise the benefit of water resources in order to contribute to food security we must reduce wastage of harvest through good handling, increased investment in post-harvest, as well as its use as food. High quality produce may also be used for alternative economic purposes, such as indirect animal feed and fertilizer for plants, medicine and others.

In addition, infrastructure is necessary to benefit from fish resources. According to FAO (2001), the existence of an effective marketing system where the consumer can get the fish at the right time and place requires infrastructure and important facilities needed for marketing fish locally and the physical development of markets. Providing the fish market requirements with different facilities and amenities can provide high-value products, whether food or cash, as well as the provision of consumer demand. These facilities must be in good condition. Post-harvest losses of fish occur in various forms. Not only do these wastages lead to economic loss - when spoiled fish is discarded – it can result in nutritional loss due to reprocessing – high smoking temperature degrades fish protein and can reduce amino acids functionality. Global demand for fish is growing and understanding existing handling and marketing channels is essential to maintain reliable supply chains and a fisheries sector that benefits farmers and the nation at large (Delgado et al., 2003).

6.7 Fish Consumption

The last segment of the fish value chain is the consumers who purchase fish products from retailers or directly from fish catchers. All the other segments of the value chain together determine the type, quality and price of fish that a consumer pays (see chapter nine). The cost of distribution and logistics operations are also very essential where the price has a significant impact on consumer behaviour during the choice of food. This is because the goal is not just to deliver an excellent product to the customer but also the final price must suit the consumer. Fish pricing methods vary from one country to another. For example, Rahman et al. (2009) in their study about the marketing system in Bangladesh state that the government does not interfere in pricing policy, but pricing occurs in multiple ways, including open auction or bargain and whisper; the auctioneer who announces tenders takes his commission from the wholesaler. In addition, there are many factors affecting the price of fish including species type, weight and form of preservation (Matiya and Kazima, 2003). This suggests that fish trading can be dynamic; species type, size and form of preservation play an important role in determining the prices and consumption preferences. A number of sections in this thesis (for example, section 5.3) have documented literature and empirical findings about fish consumption and consumption behaviour. So the researcher does not intend to expand on them in this section. Instead, the section that follows argues for analysing the fishing value chain due to the direct relationship between fisheries value chain and the natural environment. The adoption of sustainable fishing practices is an important external issue that influence activities within the value chain because over fishing, stock depletion, unregulated fishing, and environmental pollution are threatening fish industries globally.

6.8 The Sustainability of Fisheries Sector

Fisheries plays a vital role in human development but sustainable fisheries plays a crucial role in food and well-being, and in securing the livelihoods of more than 50 million people (FAO, 2012b). The fisheries sector capability to provide these benefits has been immensely disturbed due to constraints and threats of over-exploitation, environmental degradation, competition for water and coastal areas, climate change and poor or limited value addition (FAO, 2015). While some of these constraints are natural, for example climate change and global warming situation, others are man-made. For those man-made threats, Brauer and Dunne (2012:13) strongly affirm that: “greed for quick money tempts policy makers to overlook environmental sustainability, coupled with “asset stripping” which curtails the capacity for future production”. The FAO in this instance has been advocating for serious attention to be paid to the sustainability of fisheries and the conservation of endangered fish species throughout the value chain - not only for meeting the short-term needs of consumers but sustainable fish management practices, secure catch for the future, protect marine environment and safeguard jobs of all those employed in the chain of activities in the sector (Marine Stewardship Council 2014).

According to Charles (1994), sustainable development in fisheries contains multiple main components, namely, ecological (environmental), socio-economic and community-related and, the fourth factor, institutional sustainability, which interacts with all the above three key elements to negatively or positively affect their function (see figure 6.4). For example, Charles and Herrera (1994) stated that the successful development of fisheries depends on achieving sustainability in the economic, social and institutional environment. In other words, the sustainability system might be negatively affected if the policy is directed towards increasing a particular item at the expense or a reduction of another element. All of these elements depend mainly on resource management (Charles and Herrera, 1994).

The first element, ecological sustainability, ensures that capacity and quality of fish species are maintained and enhanced over time (Charles and Herrera, 1994). This element aims at avoiding excessive fishing and stock collapses, by controlling the number and species catches, and fleet capacity allocation (Joseph, 2003b). FAO (2014) report that the global percentage of fishing exceeded 70 percent of optimum capacity in 2011. As part of management plans, states need to estimate fish stocks in their territorial waters to determine the quantity of fish that fishermen should not go beyond to maintain this wealth in order to give an opportunity for fisheries to regenerate properly and protect fisheries wealth from extinction (Al- Honey, 1995). Many developed countries (such as USA, Canada, Spain, France and New Zealand) recognise the importance of user involvement in resource management. Accordingly, they engage fishermen in the administration of marine resources (Jentoft and MCCay, 1995).

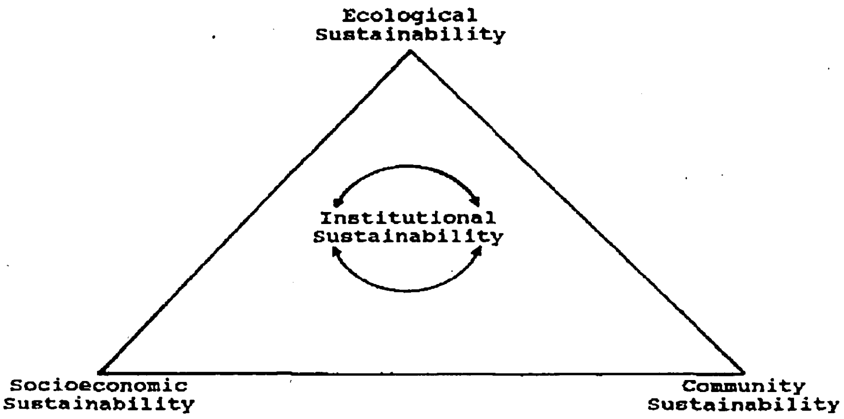
Ecological Sustainability
Institutional Sustainability
Socioeconomic Sustainability
Community Sustainability

Figure 6.4: Towards sustainability - the fishery experience.
Source: Adapted from Charles (1994:205)

Fisheries management is not limited to the government alone, all those involved in the value chain and other stakeholders (fishermen, handlers, processors, retailers, wholesalers, consumers, governments, scientists, and other fishery organisations) also play a major role in fisheries sustainability (Kuldilok, 2009). The state alone cannot achieve sustainable development in the marine wealth without involving the actual users of this wealth (Pinkerton and Weinstein 1995). For example, Alcala and Vaned (1994) state that in the Philippines, all natural resources are owned by the state and are under the supervision of the government, except agricultural lands. The state ensures the protection of these resources by enacting series of laws which give different government agencies the right to protect renewable resources in a sustainable manner. In spite of these laws, overfishing is still widespread. Therefore, governments may explore engaging fishermen in resource protection. This action will help fishing communities to build their capacity and manage resources effectively. Besides, many pitfalls would be avoided with the involvement of fishermen in planning. Similarly, the participation of fishermen in research on the sector is likely to increase robustness of findings and a bottom-up problem solution may be expressed (Pinkerton and Weinstein 1995). In line with this suggestion, a number of fishermen and stakeholders were involved and interviewed in all sectors of fisheries value chain.

The second element, community (otherwise called group) sustainability, aims at maintaining and enhancing the social, cultural and economic welfare of communities dependent and affected by fishery (Charles and Herrera, 1994). According to Symes and Phillipson (2009), social issues in fisheries receive attention in North America, Europe and Australia. These include food security, employment and protection of fisherman rights; all of these issues are taken into account when developing fisheries policies. Social issues are very important and need to be taken into account when developing plans for marine fisheries. Among the most important social issues are fisherman rights such as income and jobs where the profession of fishing is associated with seasonal periods, as well as instability of the fish market.

Socioeconomic sustainability is the third element which posits that maximum benefits can be derived from fisheries for the benefit of people as long as viability of the resources is maintained from the local to the global economy (Charles and Herrera, 1994). This means that fishing at a sustainable scale should be seen to promote human development and well-being of the fishers. As earlier indicated in chapter one, fishery industry plays a significant role in providing employment, as a source of income and provision of food diet. Moreover, fisheries contribute to the local and regional economy. However FAO (2004:75) has pointed out that: "In practical terms, the scope of the existing labour standards in fishing, in general, does not include people who work on artisanal and small-scale fishing vessels. New issues that are not covered by existing instruments include identity documents, repatriation, recruitment, medical care at sea, occupational safety and health, social security protection, and compliance and enforcement". Al these are issues that contribute to achieving this third element.

Institutional sustainability being the fourth element ensures that institutional structures (including financing, regulation and administration) are formed, administered and enforced to undertake management measures in the longer-term (Charles and Herrera, 1994). Charles (1994) opines that institutional sustainability is the prerequisite for the above three elements function through promulgation, manageability and enforceability of fishery regulations. In short, fish production, like any production process, needs successful fisheries management in order to maintain natural resources, thus, the general policy objective lies in the optimum rate of exploitation of the fishery whilst considering the rights of fishermen as pointed out by FAO (2004:75). In the case of Libyan fish catch indicated in section 1.3, the actual fish catch and production is underexploited and far less than the Maximum Sustainable Yield [MSY][31], because of the challenges outlined in section 1.5. This highlights further development possibility before the so-called optimal level of fish exploitation is reached. It also means that measures can be taken to avoid over-fishing, and sustainable practices entrenched to the current approach to fisheries management and governance system. Sustainability awareness to consumer and fishers helps in reducing the threats on fish stocks (e.g. knowing the species and maturity of fish to harvest) and make it available for future generations. Where no sustainable management measures are in place, the fishery sector that is proposed to contribute to the Libyan economy is likely to be depleted within a short period instead of being replenished for future use.

6.9 Summary

This chapter identified the aspects of fishing in the value chain processes of fish from the initial catch to the final consumer. This chain of activities is poorly developed in Libya. For Porter's factor conditions and industry support determinants to be applied successfully, these aspects of the industry need to be considered and developed holistically. Doing this creates a chain of activities that would increase value of the finished product, and ensures timely supply and consumption of healthy fish, increase jobs and the transfer of technology. Besides, fishery products have become part of a global trend and a symbol of increasing trade globalisation in the fishery sector. Good management plans are the primary tool that would consider all aspects of the industry and ensure the sustainable use of fisheries resources. As this study advocates the development of fisheries, it must also be done in line with international standards and taken into account regulations and conventions governing fisheries and the marine environment through adopting sustainability principles outlined in section 6.8.

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[31] Maximum Sustainable Yield [MSY] especially in forestry and fisheries is the maximum level at which a natural resource can be routinely exploited without long-term depletion.((Oxford Online dictionary).

On the ground every episode of value chain series branched into many overlapping activities, also these activities generated backward and forward linkages from the original series, and there may be more than one activity involved in more than one stage of the value chain. All of these activities seek to deliver products to the final consumer in good quality and appropriate price, and in the right time and place. To put it simply: value chain for the fisheries industry gradually start from the place of fishing boats and fishermen who catch fish who then brought to landing sites and are then transported and marketed to the final consumer. Value chain gives the opportunity to focus not only on the production and marketing side but also consumption. This research found that the consumption side in the fishing industry is very important because fish consumption is determined by many factors including those that are difficult to control, such as customs and traditions. However, these factors changes with changing economic factors.

It could be argued that the value chain is used to describe or used as a tool to evaluate the industry as well as to identify the links and causal relationships of all activities. It may appear that each stage of the value chain is simple but in reality it is not so simple. For example, any decision to be made in one activity chain is likely to affect the proceeding activity and subsequently the rest of the chains. In the case of Libya, it is very important to include the value chain backward and forward linkages and their related activities to provide inputs that increase output and raise the value of fish as the end product. Chapter (eight) is an empirical finding of PDM factor conditions of Libya fisheries development.

Chapter Seven

Methodology, Methods and Field Study

7.0 Introduction

The literature has shown that Libyan resources have not been fully exploited due to the resource curse syndrome. Subsequently chapter two and three have indicated how oil has impacted on the economy and inhibited the diversification to other non-oil commodities. The competitive advantage inherent in the fisheries sector discussed also indicates that there was insufficient detailed study about fisheries sector in Libya, despite the abundance of fish, a long coastline and a rich marine life. Moreover, it was also found that there has been poor attention to the fisheries sector in the last few decades because the emphasis was on growing the economy by relying only on oil. Overall, there is a lack of study of the various factors that relates to the factors for fish production and consumption, and how these factors can affect the contribution of fisheries in the economy, particularly in this period of post-conflict economic planning. This study, therefore, examined how fisheries can become one of the development areas and an important economic sector in Libya by using a number of approaches including: 1) Applying Porter's Diamond Model as Model for assessing fisheries competitiveness in the midst of the resource curse phenomenon; 2) Applying Shepherd's model to measure food choice and consumption; and 3) Combining both quantitative and qualitative methodologies to derive as much data and information as possible. This chapter presents the research methodology and epistemological issues relating to the choice of methods.

The chapter begins by explaining the philosophical and theoretical underpinnings of the research study (7.1). It delineates the aims of the research, as well as related questions and associates these with the relevant theories used in the fieldwork. This is followed by discussion of the research methods used and an explanation of the data collection process (7.2). The field study and the analyses of the case study are presented in sections7.5 and 7.6. Questionnaire design based on Shepherd's model explained in section 7.7.3. The analytical techniques used in the research are explained and justified in section 7.7. Ethical issues discussed in section 7.10. This was followed by a discussion of fieldwork limitations in (7.10.1).

7.1 Philosophy, Theoretical Perspectives and Methodology of the Research

It is significant to consider various research paradigms of ontology and epistemology when undertaking any research, where these parameters explain perceptions, assumptions, beliefs, and the nature of realism and fact (Flowers, 2009).

7.1.1 Ontology

Blaikie (1993) in Flowers (2009) describes ontology as "the science or study of being". Ontology is the starting point of all research; ontological assumptions are concerned with what we believe constitutes social reality (Grix, 2004). Grix (2004) adds that it is impossible to engage in any sort of ordered thinking about the political or social world without making a commitment to some sort of social ontology. Ontological positions are divided between those based on foundationalism and those based on anti-foundationalism. Foundationalist ontology believes that reality is thought to exist independently of our knowledge of it. Based on this position and in the context of this research, the factors that affect the fisheries sector exist independently of what actors believe is the reality of it. In other words, problems are considered as problems regardless of whether the researcher perceives them as such or not. On the other hand, anti-foundationalist ontology does not believe that the world exists independently of our knowledge of it, but rather reality is socially and discursively constructed by human actors (Grix, 2004). In line with this research, this position posits that issues that are related to the fisheries sector and its development lies within the perceptions, thoughts and feelings of key actors involved. Hence, the two ontological claims are both relevant philosophical underpinning to this research. When considering that the above different views exist regarding what constitutes reality, another question must be how this reality is measured, and what constitutes knowledge of that reality. This leads us to the questions of epistemology (Flowers, 2009).

7.1.2 Epistemology

Epistemology is about how we come to know what we know (Crotty, 1998:8). Epistemology considers views about the most appropriate ways of enquiring into the nature of the world (Easterby-Smith and Jackson, 2008). In addition, Gray (2009:19) refers to "the existing interrelationship between the theoretical stance adopted by the researcher, the methodology and methods used, and the researcher's view of the epistemology". As figure 7.1 indicates, there is a range of epistemologies; however, there are three key paradigms (positivist (classical), interpretivist /constructivist (classical) and realist (contemporary) which appear in the lexicon of social science methodologists (Flowers, 2009). Depending on the chosen research paradigm, a range of suitable methodologies and methods can be employed.

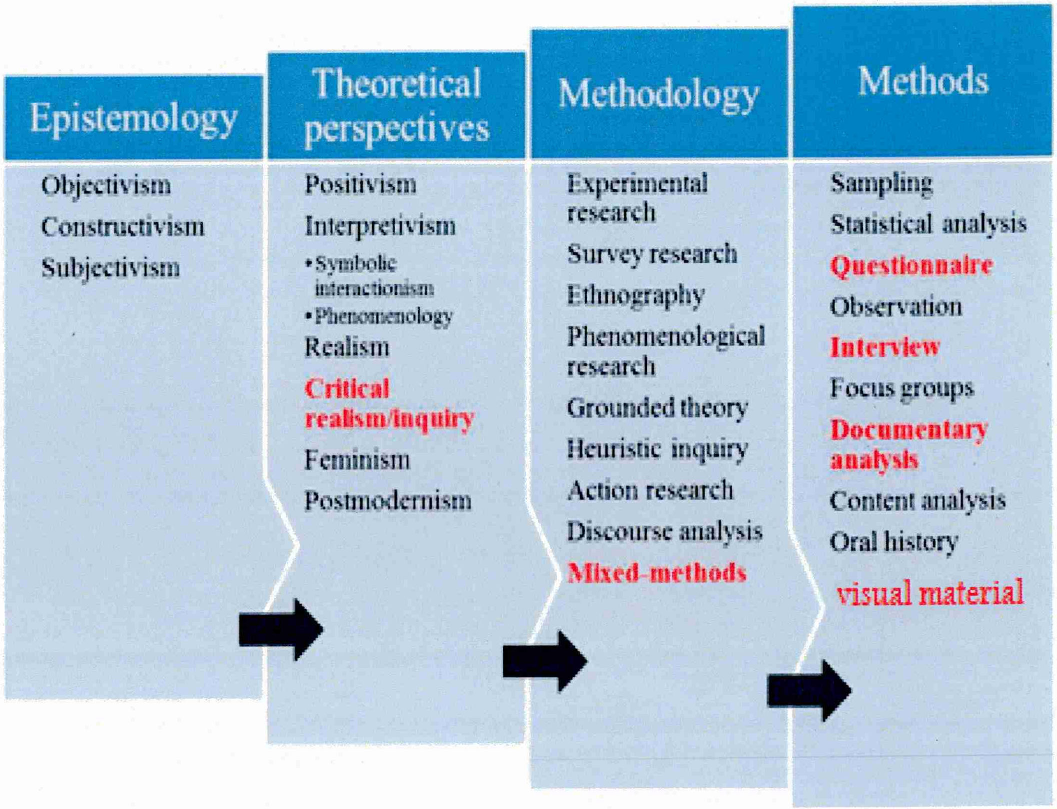

Epistemology
Objectivism
Constructivism
Subjectivism
Theoretical perspectives
Positivism
Interpretivism
•Symbolic interactionism
•Phenomenology
Realism
Critical realism/inquiry
Feminism
Postmodernism
Methodology
Experimental research
Survey research
Ethnography
Phenomenological research
Grounded theory
Heuristic inquiry
Action research
Discourse analysis
Mixed-methods
Methods
Sampling
Statistical analysis
Questionnaire
Observation
Interview
Focus groups
Documentary analysis
Content analysis
Oral history
visual material

Figure 7.1: Epistemology, theoretical perspectives, methodology and methods (adapted from Crotty, 1998).

The Positivist position is derived from that of natural science. This position presumes the social world exists objectively and externally and that knowledge is valid only if it is based on observations of this external reality (Crotty, 1998). Moreover, it presumes that universal or general laws exist and theoretical models can be developed in such a way that they are generalizable, can explain cause and effect relationships, and which lend themselves to predicting outcomes (Flowers, 2009). Positivism is based upon values of reason, truth and validity and there is a focus purely on facts, gathered through direct observation and experience, in others words all reality is meaningless, independent from human feelings, ideas, perceptions and social phenomena have to be treated like physical objects. Positivism is measured empirically using quantitative methods –

surveys and experiments - and statistical methods of analysis (Heyman, 2009). As this research is not aimed at testing theory, the paradigm approach was not an option.

The interpretivist/constructivist position contends that there is a fundamental difference between the subject matters of the natural and the social sciences. In the social world it is argued that individuals and groups make sense of situations based upon their individual experience, memories and expectations (Flowers, 2009). Meaning therefore is constructed and (over time) constantly re-constructed through experience resulting in many differing interpretations. In this position understanding what people are thinking and feeling, as well as how they communicate, verbally and non-verbally, are considered to be important. In others words, reality is meaningful, and it is socially constructed by the individuals who participate in it, and there is not one absolute truth, but different truths and realities, mainly making use of qualitative methods (Heyman, 2009). Although the study set out to infer meanings, understand the viewpoints and interpret the experiences of the research participants, using qualitative methods such as interviews, other constraints were believed to have an impact on the perceptions and behaviours of participants. These include social, cultural, economic and political dimensions as this study will show in forthcoming chapters. Thus, the interpretive paradigm did not seem appropriate for this study.

The third epistemological position known as realism appears to be based on features from both positivist and interpretive epistemologies. Realists hold that reality and real structures exist independent of human consciousness and that the essence of things is objectively given in nature; yet, that knowledge is socially created and conditioned, thus prompting the use of quantitative and qualitative data collection methods (Saunders et al., 2009). The realist paradigm has influenced the approach of this research in its quest to understanding reality. Realism is of many types; the first is direct realism. Direct realism says that what you see is what you get, in other words what we experience through our senses portrays the world accurately (Bhaskar, 1998). The second, known as critical realism, has emerged as an alternative to positivist and interpretive research during the past decade (Bygstad and Munkvold, 2011). It holds that real structure exists independent of human consciousness, but that knowledge is socially created. Critical realism/inquiry philosophy combines realist ontology with an interpretive epistemology (Bygstad and Munkvold, 2011; Bhaskar 1998; Verstegen, 2000). In the current study the researcher adopted a critical realist's position which implies that the knowledge of reality (the fisheries sector as a real structure in Libya) is a result of social conditioning and cannot be understood independently of its social actors (such as fishermen, wholesalers, government officials and other stakeholders). Moreover, the research process relied on the combination of both quantitative and qualitative methods to gather both data susceptible to statistical analysis and interpretation.

Furthermore, the critical realist would recognise the importance of a multi-level study (for example, at the level of the individual, the group and the organisation). Each of these levels has the capacity to change the researcher's understanding of what is being studied. This would be the consequence of the existence of a greater variety of structures, procedures and processes and the capacity that these structures, procedures and processes have to interact with one another (Saunders et al., 2007). Saunders et al. (2009) also argue that the critical realist's position that the social world is constantly changing is much more in line with the purpose of business and management research which is often to understand the reason for phenomena as a precursor to recommending change. In line with Saunders et al. (2009), this research explored why the contribution of the fisheries sector to the Libyan economy is low and examines how this status could change. It is not an easy task to explain how the fisheries sector can contribute to the Libyan economy (by considering individual, group and organisational involvement); hence a suitable approach is required to examine these interrelationships. Critical realism could be beneficial in unravelling the complex nature of this issue: it helps identify the mechanisms that led to the reasons for the failure of this sector and explores the mechanisms that could lead to developing and upgrading it. In addition, three hierarchically arranged layers are distinguished in critical realist literature: the empirical, the actual and the real. The experiences, events and mechanisms are, respectively, situated in these three layers (Bhaskar, 1978). As section 7.2 highlights, this research is approached in the light of these three primary layers.

7.2 Approaches for this Study

The current study adopted a critical realist approach which could explain the current status and explore the factors that affect the development of the fisheries sector in the eastern region of Libya through applying Porter's Diamond Model (see figure 5.2), based on the three layers: the real, actual, and empirical. As indicated in section 4.2, the fisheries sector (in the light of the diamond model) was scrutinised under four main determinants (factor conditions, demand conditions, supporting and related industries and the fisheries sector's strategy, structure and rivalry) and two assisting determinants (role of government and chance). The determinants of the diamond model do not work individually but affect each other and thus constitute a complex system. Each determinant consists of a group of factors which interact with each other. Every determinant of Porter's diamond model has an essential role in achieving competitive advantage; however, demand conditions through domestic demand have a powerful impact in developing any industry. Porter (1998:86) confirms that "the most important influence of home demand on competitive advantage is through the mix and character of home buyer needs". Therefore, special attention to the factors that influence consumer choice is given; thus, the fisheries sector is analysed taking into account the demand side. At the same time, a model developed by Shepherd (1985) has been chosen for the current study to understand consumers' behaviour toward fish consumption.

Furthermore, Porter (1990) states that "nations gain competitive advantage in industries where the home demand gives their companies a clearer or earlier picture of emerging buyer needs". To explain the quantity of local fish demand, quantitative analysis by Chi-square test and logistic regression analysis was applied, which provides more focus on the relationships between variables - whether those variables are related to socio-economic consumer characteristics or other variables related - to examining the association between those factors and fish consumption (see section 7.9. for Chi-square test and logistic regression details).

The whole process of fisheries includes many mechanisms and structures such as input suppliers, the transportation and distribution channels and sellers; the industry is also affected by the international fish markets, in addition to the factors that affect fish choice. In addition, all of these processes are affected by national and international laws and regulations. Certain mechanisms cause the failure or success of the fishing industry, and therein lies the power of the critical realism approach, which focuses on the causal structures to explain the reasons behind the failure or success of this sector. Therefore, this research study is approached in light of the three primary layers (the real, the actual and the empirical) developed by Bhaskar (1978). As captured by Basden (2004) citied in Klein (2004) "the *real* are the causal mechanisms and structures that produce *actual* events a subset of which then is *empirically* observed". These are analysed as follows:

1) The real domain includes the mechanisms that have generated the actual events (Mingers and Willcocks, 2004), such as macroeconomic environment that shape the economic policy promulgated by the Libyan state, and the economic planning where they interact with existing economic structures in the form of institutions, as well as the laws and regulations related to the economy.
2) The actual domain refers to what actually happens, whether observed or not (Basden, 2004). The lack of diversity in the structure of the Libyan economy, lack of investment activity in the field of marine resources, and weak institutions all contribute to the limited success of the fisheries sector. This accounts for the poor and abysmal contribution to the GDP by the fisheries sector.
3) The empirical dimension refers to what is observed. The observation usually being assumed is usually not of an informal, casual, everyday kind, but of a formal, analytical, theoretical kind (Basden, 2004). In the fisheries sector the empirical dimension was realised through the combined viewpoints of fishermen, consumers, wholesalers, retailers as well as the government and marine experts.

From the above, critical realism assumes that the world is diverse and orderly, stratified and it is the task of science to uncover these structures. The critical realism approach helped in identifying the mechanisms that led to the reasons for the failure of this sector in contributing to the national GDP. Remarkably, a number of recommendations were proposed on how to develop and strengthen this weak sector that is full of potential.

7.3 Research Design and Strategy

Hussey and Hussey (1997) hold that there are four types of research design: exploratory, descriptive, analytical and predictive. Yin (2003) also identified three types of case study:

1) *Exploratory case study*: used by researchers who are challenged by the shortage of related literature about the topic being examined.
2) *Explanatory case study*: conducted by researchers who focus on causality and aim to provide detailed explanations rather than descriptions.
3) *Descriptive case study*: this type of case study is used to describe specific events in a very detailed context.

This study can be described as an exploratory and explanatory piece of research as it investigates the perspectives of actors and their expectations on the role of fisheries in the economic future of Libya. To achieve the study's aims and to empirically examine the factors that impact on the fisheries sector in the eastern region of Libya a case study strategy is adopted.

The case study approach is appropriate for investigating how theory applies in practices and to explain or explore conditions (Yin, 2009). Cohen et al (2000: 181) state that a case study has been defined as a "specific instance designed to illustrate a more general principle and it provides a unique example of real people in a real situation". Robson (2002) defined case study as: "a strategy for doing research which involves an empirical investigation of a particular contemporary phenomenon within its real life context using multiple source of evidence". Furthermore, Cassell and Symon (2004) stated that a case study is a detailed investigation, by which the data is collected over a certain period of time, of phenomenon within their context. The case study approach usually tends to be inductive and commonly includes many methods such as observation, ethnography, interviews, questionnaires, or a combination of these. Many researchers will use a mixture of methods to address the research issues, as is the case in this research. Apart from multi-method approach, data was collected from a number of sites within the case study, so as to enhance generalisation of findings and demonstrate that the issues 'are not wholly idiosyncratic' (Miles and Huberman, 1984).

The case study is an empirical inquiry that investigates a contemporary phenomenon (the case) in depth and within its real-world context, especially when the boundaries between phenomenon and context may not be clearly evident (Yin, 2014). Yin (2003) wrote that case study strategy is used in several situations to contribute to knowledge; it has been a common research strategy in sociology, psychology, business and political science. He added that case study can be found in economics, in investigations about the structure of a given industry or the economy of a city or region. Stake (2000: 437-438) categorises case studies into three; (1) the intrinsic case study which is designed to better understand a specific case without necessarily seeking to generalise or build a theory out of understanding; (2) the instrumental case study is focused on to provide in-depth understanding of an issue so as to facilitate better understanding of a situation under study and (3) the collective case study which is designed to explore differences within and between cases with an aim of replicating findings across cases.

Case study 'design' is another important consideration (alongside 'type'). Two broad case study designs are proposed by Yin (2003; 2009; 2014) namely, single case design (one case is focus of the study) and multiple case design (involves more than one case). He further categorised case studies based on their broad design, whereby Yin (2014) differentiated between the single or holistic case study and what Yin termed an embedded case study design, with the section of either depending on the units of analysis. For a single holistic design, the case study is applied in one unique environment as a single unit whereas an embedded case design, allows the research to undertake multiple sub-case studies allowing analysis to take place within, across and between sub units before this is tied up into a global analysis of the overall case study. Similarly a multiple holistic design will involve each of the individual cases being analysed in its total nature while the multiple embedded design will involve first analysing sub units within each of the cases before marrying the findings to form a single analysis of the individual cases making up the multiple case study design.

Identifying the 'case' and determining the specific' type' and design of case study was core issue in designing this research. See figure 7.2 below for an illustration of this. In the end, the researcher settled on a single embedded case study taking into account Yin's (2003; 2009) argument that the use of sub-units allows for the researcher to engage in rich analysis serves to better illuminate the case. By this, it has allowed the researcher to examine the different components of fisheries, for example, the features of the industry, the processes involved in fish catch, distribution channels and marketing, and final consumer's choice of fish food. It has also enabled collection of evidence on examining contemporary events affecting fisheries, such as sustainability and industry regulations.

Yin (2009) recommended single case study design when a study aims to examine a phenomenon though focusing on unit of analysis. With regard to the different ways of designing case studies, this study should be considered as a single case study (Yin, 2003; 2009) because it focused on one sector (the fisheries sector), different aspects within it (supply side and demand side) from a selected geographical area (eastern region of Libya). Thus, the focus on data examination was not only applied to explore current status of fisheries, but was also applicable to examine determinants of competitive advantage for the whole fisheries sector.

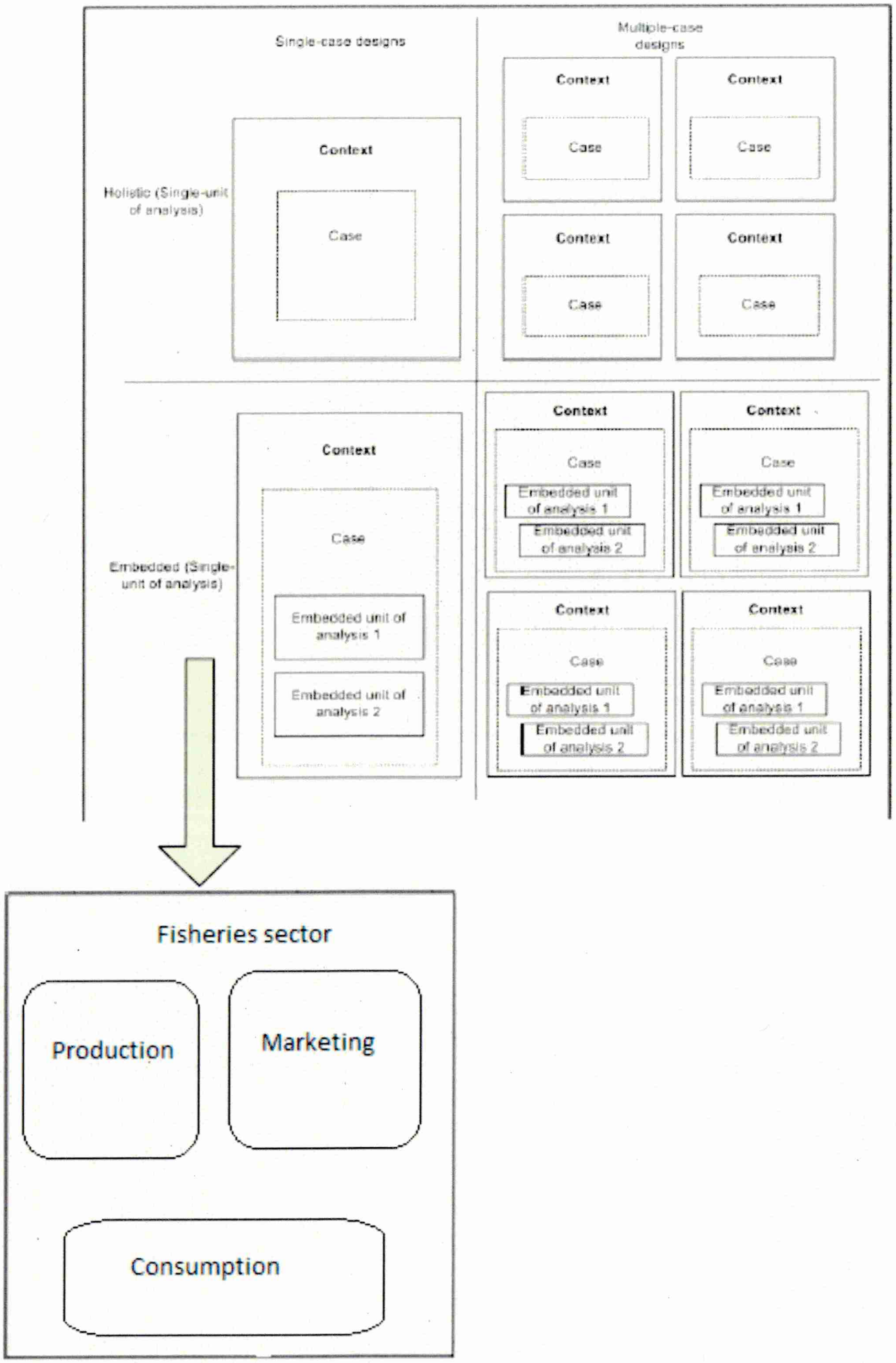

Single-case designs
Multiple-case designs
Holistic (Single-unit of analysis)
Context
Case
Embedded (Single-unit of analysis)
Embedded unit of analysis 1
Embedded unit of analysis 2
Fisheries sector
Production
Marketing
Consumption

Figure 7.2 Single case study design of the study. Adapted from Yin (2009:46)

7.4 Methods of Data Collection

Mixed methods research (qualitative and quantitative data collection) was adopted in line with the growing support for using mixed methods in social science research (Creswell, 2009; Creswell and Plano Clark, 2007; Johnson et al., 2007; Morgan, 2007).

Creswell et al (2004) defined the mixed method as "Integrating quantitative and qualitative data collection and analysis in a single study or a program of enquiry. Mixed method approach has been found to be particularly helpful in; strengthening of validity of findings given that it allows for diverse data collection, getting different perspectives on the matter under study, ensuring there are no gaps in the data collected and protecting the study against the researchers' bias, Bulsara (2005).

The combination of qualitative and quantitative methods is well established in case studies (Yin, 2014; Crowe et al., 2011). Yin, (2014) identify six methods of data collection for case studies; these are interview, documentation, archival records, physical artefacts, participant observation, and direct observations. Tellis (1997) adds questionnaire survey. The relevant methods for this research include questionnaire survey, interview and documents and visual material. A mixed methods research design allows for the use of both quantitative and qualitative research methods in a single study Creswell, (2012). Each of the two categories of the methods is administered differently and each has its own strengths and weakness. In addition to the strengths outlined in the preceding sections of mixed method approach, Driessnack et al. (2007) outlines a further five main purposes for using more than one method in a study of this nature. These include; 1) triangulation of data which refers to convergence of findings from the different data collection methods; 2) complementarity which allows for a wider range of insights and perspectives given that the different methods allows for harnessing of capacity for investigating different aspects of the phenomena under study; 3) development which involve tapping into the data collected through one method to refine a tool for another method; 4) initiation which involves using another method to deliberately analyse emerging perspectives discerned through the use of different method and expansion which imply that the use of different methods may allow for a more expanded scope of a study.

The choice of mixed methods for this study was largely informed by a need for both triangulation and complementarity; the use of the qualitative component(interviews, document and visual) served to corroborate data gathered through quantitative method(survey) and also allowed for the generation of viewpoints that could not be obtained using the survey (Morse, 2003). Further, the rationale behind the use of these methods also relates to the research objective of examining the main research question of the study, which is: why is the contribution of the fisheries sector weak in the GDP;

and how can this sector contribute to the economic diversification of Libya? This section provides an overview of these methods, their merits and shortcomings, and their appropriateness as choice methods in meeting the objectives of the study. Table 7.1 shows strengths and weaknesses of quantitative, qualitative and mixed approaches.

Table 7.1: Strengths and weaknesses of quantitative, qualitative and mixed approaches

Research Processes		**Approaches**		
		Quantity Approaches	**Qualitative Approaches**	**Mixed Approaches**
Purpose		To test and validate existing theories about how phenomena occurs	To produce rounded and contextual understanding of the basis of rich, nuanced and detailed data	To provide quantitative and qualitative research strengths and to lessen weakness
Usage		Used in large-scale studies	Used in in-depth small-scale studies or for examining complex phenomena	Answering a broader and more complete range of research questions
process	Strengths	Testing hypothesis that are constructed before the data are collected	Research can study dynamic processes	Possibility of generating and testing a grounded theory
	Weaknesses	Researchers categories used may not reflect local constituencies understanding	Focused and limited	Difficult for a single researcher to use more than one method at the same time
Data collection	Strengths	Quicker data collection	In naturalistic settings based on the participants own categories and understanding of meanings	Collecting both qualitative and quantitative data
	Weaknesses	Validity and reliability issues	Time consuming	More expensive and time consuming
Data analysis	Strengths	Provide precise, numeric information and is relatively less time consuming	Can conduct cross-case comparison and analysis; data collection and analysis are interconnected	Triangulation of the approach increases generalisability and reliability of the results
	Weaknesses	Using theories might affect population understanding	Researcher might influence findings (subjective perspective); time consuming	More expensive and consume more time to prepare data; uses both inductive and deductive analysis
Report findings	Strengths	Findings are independent of the researcher; enhances research findings	Describe true picture of phenomena embedded in local context; responsive to local situations and stakeholder needs	Both numeric and words can be combined to provide stronger evidence for a conclusion through convergence and collaboration of findings
	Weaknesses	Produces knowledge that might be too general and is not appropriate for direct application	Produces knowledge that might not be easy to generalise; outcome might be influenced by researcher's perspective	Researcher has to learn how to combine appropriately the different methods in the research.

Adapted from Hossain (2008); Hoepfl (1997); Hancock and Algozzine (2006)

7.4.1 Documents

According to oxford dictionary a document is “a piece of written, printed, or electronic matter that provides information or evidence or that serves as an official record”. The documentary methods involves exploration of written documents whether in public or private domain with a view of extracting information about the study's subject of interest (Bailey 1994; Payne and Payne 2004). According to Yin (2014) documentation is one of six sources of data evidence when using case study research and these documents include different forms; such as letters, agendas, administrative documents, formal studies or evaluations and news clippings. The public documents are in most cases government publications while the private documents are often sourced from civil societies. It is believed that documents are important in qualitative research because access to them is often easy and low cost, and they provide information that differs from what may be gained from interviews (Daymon and Holloway, 2002; 2010). The information is obtained through documents analysis which involves systematic exploration and synthesis of data from documents is particularly considered valuable in methodological and data triangulation in case study research (Bowen, 2009). In addition, the analysis of data from documents does help in understanding phenomena better and is also considered useful in developing empirical knowledge (Rapley, 2007; Corbin and Strauss, 2008).

However, in using data from documents, it is always important to take into consideration the origins and original purpose of the documents since in most cases the documents are not intended for research. As such, for accurate interpretation of the data presented by documents, it is critical for one to establish the specific assumptions that the words and images in the documents are based on. Payne and Payne (2004) cited in Flick (2009) argues that the analysis of documents can be used as a complementary strategy to other methods, such as interviews or ethnography, or as a stand-alone method and that analysing documents helps researchers’ gain access to the evidence and thinking of others. Yin (2009) asserts that the importance of documents lies in increasing evidence from other sources through firstly, verifying the correct spelling of names or titles of organisations mentioned in an interview; secondly, providing other details to confirm information from other sources and thirdly, making inferences from documents which may assist in discovering new questions. Bailey (1994) contends that documentary data is often as good as the data collected through other traditional qualitative methods and sometime is even more cost effective.

Writing on the same subject, Glenn (2009) presents the specific functions of documentary material in research as; providing direct background and historical information of a phenomena, which enables the researcher to develop a deeper understanding of the context for the study and provide a framework for interpreting present or emerging issue; providing information (data) that may be used to refine the research questions; providing secondary data thereby expanding the researchers understanding of the phenomena understudy; providing information on the progress, changes and development in a project (through different drafts of a particular document) and helping a researcher deduce information (from periodic reports by an organisation) on the organisation's growth with the specified period.

For this study, government documents and non- government documents were used. Primarily, documents were used in this study to enhance the validity of the primary resources by checking for convergence of the findings from the primary sources and those from the related documents (Denzin, 1970). It should be noted that the documents used for this study contained important official details about the fisheries sector, some of which the researcher could not obtain through data collection. For example, the development plan of the Libyan Marine Sector (2006-2010) provided by National Foundation for Maritime Investment helped the researcher with other findings from other sources (the questionnaire and interviews) to assess whether the government was able to achieve of the objectives of the last plan or not. Also, it makes the discussion on the topic more objective. Merriam (1988: 118) asserts that: ''Documents of all types can help the researcher uncover meaning, develop understanding, and discover insights relevant to the research problem". In agreement with Merriam, the documents indeed helped the researcher to understand the context and the problems facing the fisheries sector in Libya.

As alluded to in the previous section, and in agreement with Yin's (2014), by choosing to use documents as one the sources of data for this study, the researcher sought to take advantage of some of the strengths of document analysis including; it being efficient in terms of amount of time invested in collecting the data; the increased (due to internet connectivity) availability of documents for public access; it facilitating in a cost effective manner access to data that would have been practically not possible to collect; its stability in that it is not subject to respondents feelings and reactions to the investigator and the fact that it allows for broad data collection in terms of time span, settings and events, (Yin, 2014). Equally important was the concern for quality control in handling the documentary sources of data. According to Scott (1990; 2014), every researcher must pay attention to aspects of authenticity, representativeness and meaning to ensure that data collected through documents are of quality. The researcher's consideration on the three constructs during the study is discussed in the section below:

- **Authenticity**

Mogalakwe (2006) states that the authenticity of any data is determined by its reliability, genuineness and dependability and these are considered as the core of any research and must therefore be a key area of attention and responsibility for any researcher. In regards to data from documents, he emphasises that extra caution must be taken by the researcher in confirming the integrity of the document. Platt (1981) citied in Ahmad (2010), contends that documents are subject to falsification and thus advocates for close scrutiny of the 'could be sources of data documents' by the researchers to ensure that they do not collect data from forgeries. He opines that particular care should be taken particularly when there are obvious errors in a document; there is incoherence in regards to style and content flow; when there are different unexplained versions of the document; when the source of the document is dubious or unreliable and when the document has been handled by a person with vested interest in the study.

For this study, the researcher was able to collect in person the original government documents from key institutions like universities and established research institutions in the country; key amongst them being Marine Biology Research Centre MBRC and the National Foundation for Maritime investment. This was made possible by the fact that the researcher had personal relationships with some of the key contacts including top experts in the institutions. A case in point is when the researcher travelled to Tripoli in 2010 and visited the Marine Biology Research Centre MBRC and the National Foundation for Maritime investment and collected relevant reports from the experts who had contributed in the writing of the reports. In addition to the aforementioned reports, the researcher also used documents from international organisations such as the FAO. These documents were sourced from the organisations websites.

- ***Credibility***

Credibility refers to whether the evidence is free from error and distortion (Mogalakwe, 2006). The fact that the documents used in this study, were not solely developed for the study, provides for a level of confidence in their credibility and of the data gathered from the documents in as a far as the research is concern. Any form of error or distortion would not be of particular concern to the researcher given the opportunity to triangulate the data with data gathered through the other methods (Bowen, 2009).

- ***Representativeness***

Representativeness is the consideration with the external validity of the data gathered from the selected documents. The selection of the documents and therefore their representativeness largely depends on the survival and availability of documents. The survival of the documents is in most cases guaranteed when a document is deposited for example in the government central repository. A key challenge for researchers is that not all documents published get to be deposited for safe keeping and in some cases some government documents like official papers are sometimes destroyed owing to levels of sensitivity attached to them. Moreover, as Scott (1990) observes, the difficulty of accessing documents is not limited to unavailability or survival, but includes restriction of access-the researcher may be denied access to surviving documents.

- ***Meaning***

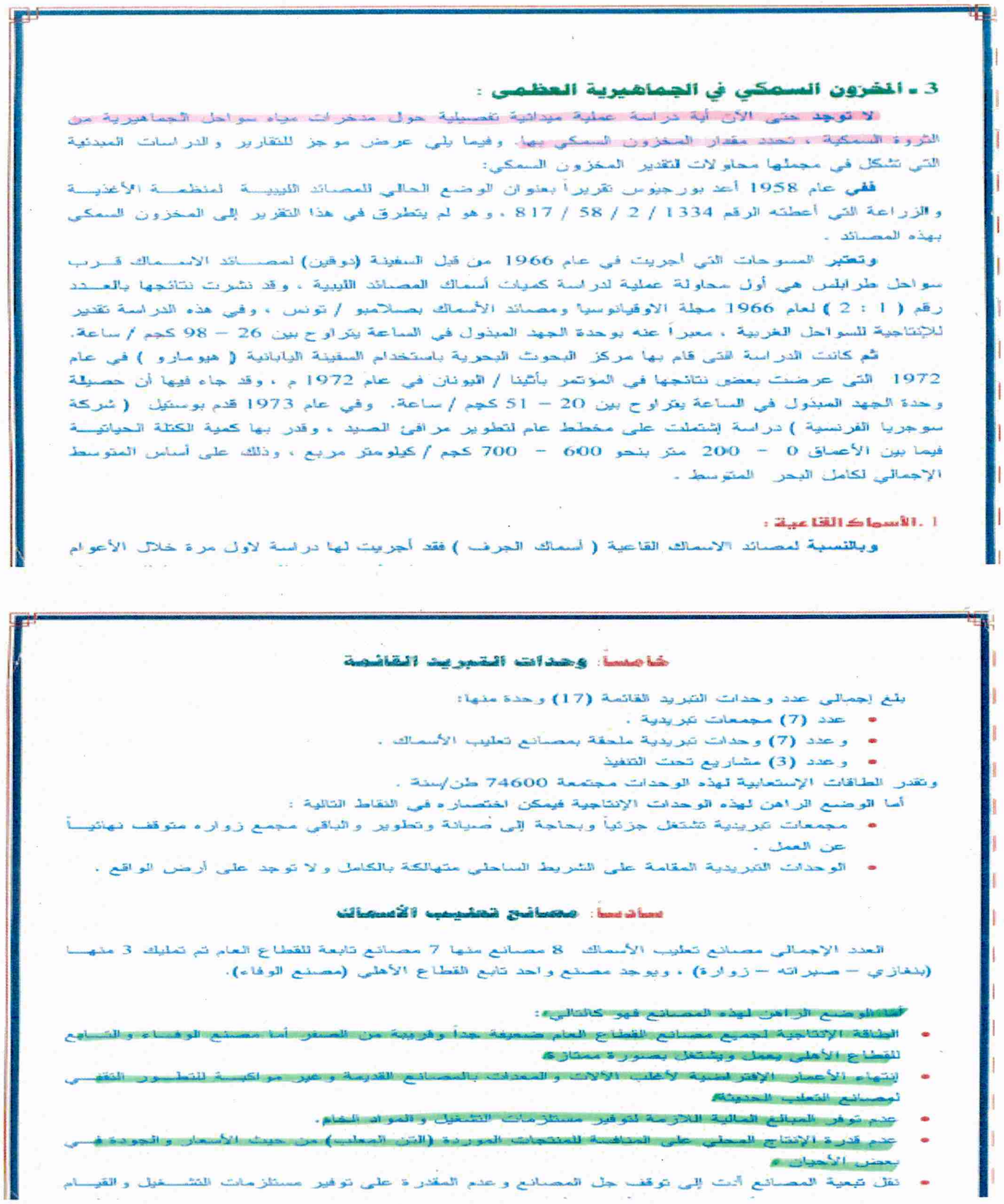
Meaning is concerned with how clear and understandable the evidence form the document is in relationship to the research problem (Scott 1990). The researcher can confirm that all the documents (Arabic and English) used in this study were intelligible.

7.4.1.1 Analysis of qualitative data from documents

Data gathered from documents is primarily analysed through a method that is generally referred to as content analysis. The analysis is made up of three steps; in the first step the data is broadly examined and may result in the separation of information in terms of its relevance to the study. The second step entails thorough examination of the same information and usually results in categorising of the key information based on the study's core questions. Interpretation of the data from the documents it is done in the third step, and it involves applying codes and themes applied in the interview transcripts thereby helping to integrate the findings from the documents' data with those generated through other methods (Strauss and Corbin, 1998; Corbin and Strauss, 2008; Bowen, 2009). The integration is made possible since in applying the interview codes to the data, more refined categories in relation to the wider study findings are arrived at and this in essence allows the researcher to synthesise the diverse data into more coherent shapes leading to generation of concepts and subsequently more abstract constructs which are finally placed under broad themes. Thus the codes and the themes generated out of the analysis of the content of documents serve to further integrate data gathered by different methods (Richards and Morse, 2007; Bowen, 2009).

In this study, the themes are a pre-defined by the six determinants of diamond's model (factor conditions, demand conditions, structure and strategy, and rivalry of industry, related supporting industries, government and chance) Porter (1998). Sub-themes were created using Factor conditions main divisions namely, physical resource, human resources, knowledge resources, infrastructure and capital resources. Having established the main themes, the researcher established sub-themes that were suitable for the fisheries sector. For example under natural resource, the researcher created two sub-themes: fish stocks, Pollution etc. Below is a summary of the steps used to organise and analyse the data from documents.

1. Different colour codes were chose for different themes. Examples (see figure 7.3)
2. The documents were read thoroughly, highlighting, in the process the key words as they related with the pre-established (as discussed in the preceding section) themes and sub themes.
3. The documents were translated (as the case may be), summarised and presented the researcher findings in the tabular.



3 ـ المخزون السمكي في الجماهيرية العظمى :

لا توجد حتى الآن أية دراسة عملية ميدانية تفصيلية حول مدخرات مياه سواحل الجماهيرية من الثروة السمكية ، تحدد مقدار المخزون السمكي بها. وفيما يلي عرض موجز للتقارير و الدراسات الميدنية التي تشكل في مجملها محاولات لتقدير المخزون السمكي:

ففي عام 1958 أعد بورجيوس تقريراً بعنوان الوضع الحالي للمصائد الليبية لمنظمة الأغذية والزراعة التي أعطته الرقم 1334 / 2 / 58 / 817 . وهو لم يتطرق في هذا التقرير إلى المخزون السمكي بهذه المصائد .

وتعتبر المسوحات التي أجريت في عام 1966 من قبل السفينة (دوفين) لمصائد الاسماك قرب سواحل طرابلس هي أول محاولة عملية لدراسة كميات أسماك المصائد الليبية ، وقد نشرت نتائجها بالعدد رقم (1 : 2) لعام 1966 مجلة الاوقيانوسيا ومصائد الأسماك بصلامبو / تونس ، وفي هذه الدراسة تقدير للإنتاجية للسواحل الغربية ، معبراً عنه بوحدة الجهد المبذول في الساعة يتراوح بين 26 – 98 كجم / ساعة.

ثم كانت الدراسة التي قام بها مركز البحوث البحرية باستخدام السفينة اليابانية (هيومارو) في عام 1972 التي عرضت بعض نتائجها في المؤتمر بأثينا / اليونان في عام 1972 م ، وقد جاء فيها أن حصيلة وحدة الجهد المبذول في الساعة يتراوح بين 20 – 51 كجم / ساعة. وفي عام 1973 قدم بوستيل (شركة سوجريا الفرنسية) دراسة إشتملت على مخطط عام لتطوير مرافئ الصيد ، وقدر بها كمية الكتلة الحياتية فيما بين الأعماق 0 – 200 متر بنحو 600 – 700 كجم / كيلومتر مربع ، وذلك على أساس المتوسط الإجمالي لكامل البحر المتوسط .

1 . الأسماك القاعية :

وبالنسبة لمصائد الاسماك القاعية (أسماك الجرف) فقد أجريت لها دراسة لاول مرة خلال الأعوام

خامساً: وحدات التبريد القائمة

بلغ إجمالى عدد وحدات التبريد القائمة (17) وحدة منها:

- عدد (7) مجمعات تبريدية .
- وعدد (7) وحدات تبريدية ملحقة بمصانع تعليب الأسماك .
- وعدد (3) مشاريع تحت التنفيذ

وتقدر الطاقات الإستعابية لهذه الوحدات مجتمعة 74600 طن/سنة .

أما الوضع الراهن لهذه الوحدات الإنتاجية فيمكن اختصاره في النقاط التالية :

- مجمعات تبريدية تشتغل جزئياً وبحاجة إلى صيانة وتطوير و الباقي مجمع زواره متوقف نهائياً عن العمل .
- الوحدات التبريدية المقامة على الشريط الساحلي متهالكة بالكامل و لا توجد على أرض الواقع .

سادساً: مصانع تعليب الأسماك

العدد الإجمالي مصانع تعليب الأسماك 8 مصانع منها 7 مصانع تابعة للقطاع العام تم تمليك 3 منها (بنغازي – صبراته – زوارة) . ويوجد مصنع واحد تابع القطاع الأهلي (مصنع الوفاء).

أما الوضع الراهن لهذه المصانع فهو كالتالي:

- الطاقة الإنتاجية لجميع مصانع القطاع العام ضعيفة جداً وقريبة من الصفر أما مصنع الوفاء و التابع للقطاع الأهلي يعمل ويشتغل بصورة ممتازة
- إنتهاء الأعمار الإفتراضية لأغلب الآلات و المعدات بالمصانع القديمة وعدم مواكبة للتطور التقني لمصانع التعليب الحديثة
- عدم توفر المبالغ المالية اللازمة لتوفير مستلزمات التشغيل و المواد الخام.
- عدم قدرة الإنتاج المحلي على المنافسة للمنتجات الموردة (التن المعلب) من حيث الأسعار و الجودة في بعض الأحيان .
- نقل تبعية المصانع أدت إلى توقف جل المصانع وعدم المقدرة على توفير مستلزمات التشغيل و القيام

Figure 7.3 Coding of documents text using colour technique.

The translation of the transcript into English was done by the researcher but was revised by an independent translator in order to obtain "more responsible forms of translation" (Hutta, 2009: 44) and in order to validate meanings. The details about these documents are in Table 7.2. All the documents cited within the text are contained in the references. These documents and records helped the researcher in complementing information gathered from other sources of evidence. In terms of extracting relevant data, the Libyan development plans, marine wealth development plan and sectorial reports topped the list, followed by other government departments and fisheries experts documents which also supplied valuable information.

Table 7.2: List of Documents used in the Study

No	Name of Report	issued by	Date	Language
	Government documents			
1	The development plan of the Libyan marine sector (2006-2010)	National Foundation for Maritime Investment	2005	Arabic
2	Report of Sector of Marine Resources	General Authority for Marine Wealth	2009	Arabic
5	Data and information on the location of the landing, Survey.	Salem, Al Zgozi	2007	Arabic
	Non-government documents			
6	FAO Achievements in Libya	Food and Agriculture organization (FAO)	2011	English
7	Libya and FAO agree on close cooperation.	Food and Agriculture organization (FAO)	2009	English
8	Marine problems: Pollution	World Wildlife Fund (WWF)	2003	English
9	Fishing harbour planning, construction and management	Food and Agriculture organization (FAO)	2010	English
10	National Economic Strategy. An Assessment of the Competitiveness of the Libyan Arab Jamahiriya. (Porter and Yergin ,2006)	The General Planning Council of Libya.	2006	English
11	Fish Production of Eastern Region of the Libyan Coast (Muftah Al arifi, 2008)	General Council of Culture , Libya	2008	Arabic

7.4.2 Visual Material (Photographs)

The last decade or so has seen an increase and renewed interest in the use of visual methods in research (Sweetman, 2009). Though traditionally used by anthropologists, the emerging popularity of visual methods (photographs, film, video, drawings, advertisements or media images, sketches and graphical representations) is ostensibly growing amongst sociologists and applied social researchers (Pink 2006, 2007; Collins, 2010). Indeed, there is increasing research text promoting the use of visual representations in the data analysis process some of them arguing that in comparison with the linguistic system, the visual representations provide broader and more open content thus allowing for deeper meaning (Kjørup, 1991; Dey, 1993; Ryan and Barnard, 2003). Specifically, pictures have been lauded for their ability to allow for collection of thick data in terms of abstract, complex feelings and emotions (Pederson, 2008).

Cousin (2009) explains that visual research also works well with those who prefer graphic to text-based material, including those with less confidence with literacy or language skills. In this study, the researcher used only one type of Visual data which is photographs. It is argued that methods based on photography are accepted as a subjective and reflexive form of qualitative data production and are now entrenched in major fields of inquiry, including sociology, educational research, social and cultural geography, media, cultural studies and others (Bohnsack, 2009). According to Harper (2004), photographs are a part of the unproblematic 'facts' that constitute the 'truth' of tales. Photography has been found to be useful in helping develop a field of study since its illustrative function allows for fact gathering which can help in orienting one to the environment of study. Of even greater value is the fact that photography allows one to gather data on phenomena that would necessarily be difficult to observe for a number of reasons including limited understanding (Collier and Collier, 1986).

While the use of photography as method of data collection clearly present some unique advantages it is however important to note that taking of images (photos or films) and subsequent use of images is governed by a fairly strict legal regulations. Ideally, this legal regulations though considered strict provide the minimum standards to be adhered to and often times researchers are expected to subscribe to higher ethical and moral standards (Wiles et al., 2011). This expectation is aptly captured by the following quote from Mason (2004:43):

> There is a close relationship between law and ethics but not everything that is legal is ethical. Frequently law ... attempts only to set the minimum acceptable standard. The aspirations of ethical practice are higher ... It can never be appropriate to defend proposed practice solely on the basis that it is legal.

Generally, a key ethical requirement for researchers is that they consider the implications of using data collected not just for the individual participants but also for any affiliated institutions and community (Gold, 1989; Pink, 2007). In the case of visual data which in most cases is more explicit and personal, there may be need to discriminate which aspects of the visual data to use. The generally accepted trend for ensuring confidentially and anonymity is obscuring the images of the participants (Pink, 2007). The decision on whether to use the image or the format of image to be used should also be informed by the political, social and cultural contexts within which the images will be viewed and interpreted (Davidov, 2004). Another key ethical consideration for researchers is the aspect of empowering participants to have a say in how their images are produced and shared as data from a study. This calls for mutual trust that can allow collaboration between the researcher and the participants in the production and subsequent dissemination of the visual data (Gold, 1989; Pink, 2006, 2007; Pink, 2003). The participant for example is supposed to have unhindered access to all the photos before dissemination which should be subject to their comments and recommendations (Pink, 2006). As mentioned earlier, the precautions are considered necessary since it's more difficult to ensure anonymity with visual data than with text data (Clark, 2006).

For the purpose of this research, photographs were taken by the researcher herself and were used as an observational and documentary tool to support some of the participants' responses related to the quality and state of fish markets/stalls in the chosen settings of the study. The researcher did not simply ask the owners of fish shops for permission to take photos but also explained the reasons of taking photos to the participants. Further, the ethical principles such as the beneficence and integrity (see section 7.10 research ethics) were taking in the researcher account. In the data analysis stage; the researcher carefully selected the photos to be included in the thesis. The researcher excluded many photos because she could not (even with the help of the IT support team at Sheffield Hallam university) cover the locations or settings and faces of workers to anonymise the participants and the field site (Wiles et al., 2008). These shops have problems such as a lack of hygiene or exposure of fish to the sun and dust, but the exposure of the photos can hurt owners of the business. Other photographs that are used in this study are those that were retrieved from Marine Biology Research Centre at Tajoura, Tripoli to show available types of boats in eastern coastline of Libya. The photographs can be found in latter part of this thesis where the context best permits - that is, where they fit line of presentation.

In the following two sections, the design of the case study and the field work conducted including sampling, developing and applying the methods of data collection as well as the data analysis processes are explained in details. As can be seen in these sections (7.5-7.7), the framework of the case study is based on the concept that the fisheries sector is usually analysed in economic terms – meaning, a form of market which focuses on supply and demand. The case study's design particularly accommodates the determinants that affect the fisheries sector in light of the diamond model.

7.5 Questionnaires

Questionnaires are generally regarded as a more objective research instrument that can be used to generalise results based on 'large sample sizes' (Harris and Brown 2010). Questionnaires can be managed in many ways: self-administration; by post, face-to-face interview, telephone, email, group administered, or house-hold-drop off survey (Gay and Airasian 2003; Cohen et al., 2007). ''The role of the questionnaire is to provide a standardized interview across all subjects. This is so that all respondents are asked the questions that are appropriate to them and so that, when those questions are asked or presented, it is always in exactly the same way (Brace, 2013). The questionnaire is a well-established means of collecting data on participant characteristics, their present and past behaviour as well as attitudes, beliefs and actions with respect to the topic under investigation (Bulmer, 2004 cited in Bird, 2009). It is reputed for its objectivity as a research instrument and resulting ability to produce results that can be generalised across a large sample size (Harris and Brown 2010). A questionnaire survey is considered to be a cost-effective method of collecting data on a large-scale in a relatively standardised manner. Another advantage is that it allows the respondents to express their views on issues they may not be comfortable talking about during an interview (Gray, 2009; Bryman 2012). Other advantages of questionnaires as observed by Gillham (2007) include their ability to ensure participants' anonymity, the convenience in terms of when to respond that it affords to participants; generation of data that is generally not difficult to analyse; limitation of interviewers bias and its ability to provide preliminary data for hypothesis testing. One common disadvantage of the questionnaire identified by Oppenheim (1992) is that both the researcher and participants may introduce bias to the study. Other disadvantages of questionnaires include the lack of ability to prompt or probe respondents, and the difficulty that it presents in treating questions independently (Bryman, 2008). Cargan (2007) also cautions that data from self-administered questionnaires may be limited given that they are actually responses to pre-arranged questions; additionally he contends that the validity of the data obtained from questionnaires is subject to the characteristics of the respondents. Specifically he points out that limited knowledge by participants may lead to misunderstanding of questions or non-response. He also stresses the fact that self-administered questioners' focus is on scope rather than depth.

In order to address the research aims and objectives, it was vital to gather data from a large number of participants across the selected research sites. The choice of using a questionnaire survey was appropriate in sampling wider opinion of the population. Two questionnaires, both containing open and closed questions, were constructed and administrated to gather data related to both sides of the case study, and to compliment the qualitative data that was gathered from the interviews. The first part of the questionnaire dealt with the supply side based on factor conditions of Porter's (1998) Diamond Model (see section 7.6.3). The second questionnaire mainly concerned with gathering data about demand (fish consumption), focused around Shepherd's (1985) model of food choice (see section 7.7.3). The questions were divided into factors related to: food (physical and chemical properties), the person making the choice, and to the external social and economic environment. Issues surrounding the choice of samples, administering questionnaires, selection of study sites and validity testing can be found in sections 7.5 and 7.6 respectively.

7.5.1 Sampling of Questionnaire

The study adopts two principle sampling techniques, for the survey of fisherman stratified random sampling was used. Whereas cluster sampling was adopted for the survey of consumers, each sampling method is discussed and justified below.

1- Stratified random sampling for fishing boats

Stratified random sampling was used for the fishing boats in the study. In stratified sampling, the population is divided into groups called layers, and every element in the population belongs to one strata. The best consequences are obtained when the elements in every layer are as similar as possible to the population (Walliman, 2006). It is also stated that one should use a random stratified sample when the case under study has classes with different qualities; therefore, each layer is a random sample taken according to the class size, and the total samples are taken from each layer in the same proportion. Thus, the total samples will be an accurate representation of the community in question, and the stratum will have low variances. Furthermore, sampling theory indicates that in some conditions, a stratified random sample is more competent and effective than simple random sampling as it has attributes very close to the same specifications of the community to be studied (Robson, 2002).

Kumar and Chaudhary (2004) emphasise that the main benefit of stratification is that it allows the researcher to develop a far more precise estimation of attributes of the population. They explain that is because stratification allows for the adequate representations of the distinct sub units of the population not just in terms of number but also specific characteristics within the units. This aspect, which is usually lost in simple random sampling, is guaranteed in stratified sampling even if different sampling procedures are used in different stratum. He also points out that often time the use of stratification is also due to administrative convenience that it allows. Gendoo (2005) is, however, of the opinion that stratified sampling will require the researcher to assert far more administrative effort in developing the sample, than that required for a simple random sample from the overall population. Given the complexity of the method's sampling plan which he asserts will require the researcher to prepare a series of different sample sizes for the different strata within the population. Despite Gendoo's (2005) concerns the adoption of a stratified sample allows the researcher to arrive at a sample that is a representation of all the different types of fishing boats used in the east coast of Libya (the study area) See section 7.6.2 for detailed discussion.

2- Cluster sampling for consumers

Employing this method involved demarcating the population into clusters such as cities or city blocks before selecting a random sample from each of the clusters. The clustering process is iterative; the first cluster is usually the most inclusive sampling unit. From this cluster the next most representative unit is selected and the procedure continues ending up with the selection of the participants in the study Albright et al., (2010). Brink et al. (2008) observes that the key advantage of cluster sampling is that it is comparatively cheaper than the other probability sampling methods. It is also considered more practical when the population is large and spread over a wide geographical area. It has however been criticised for being more prone to sampling errors in comparison to other sampling methods and the complexity associated with handling of statistical data from the cluster samples. However, the researcher preferred cluster sample technique because "is often utilised in market research in order to establish, examine and effectively target the individual groups of consumers that exist within a particular market place or for a specific product or brand",(djs research,2012). See section 7.7.2 for detailed discussion.

7.6 The Study Area

The initial plan of the researcher was to conduct a survey on both western and eastern regions of Libya. However, following the uprising that took place in Libya in February 2011 and subsequent military action by NATO this strategy was abandoned due to the significant risks presented to the researcher in Western Libya. As a result, it was decided to limit the data collection was restricted to the eastern region which was located in the liberated part of Libya and had a relatively more favourable and safer environment for the researcher at the time of the study.

7.6.1 The supply side of the case study

The first side of the case study is concerned with the supply aspect of the fisheries sector in the eastern region of Libya, looking at its current situation and arrangements for its improvement. This is divided into *production* and *distribution* of fresh fish.

7.6.1.1 Selection of the study areas

In terms of the selection of the study areas for the production side, the fieldwork covered four fishing harbours that are located on the eastern region's coastline. These harbours are: Benghazi, Soush, Derna and Tubruk which are the main ports in eastern region (see figure 7.4).

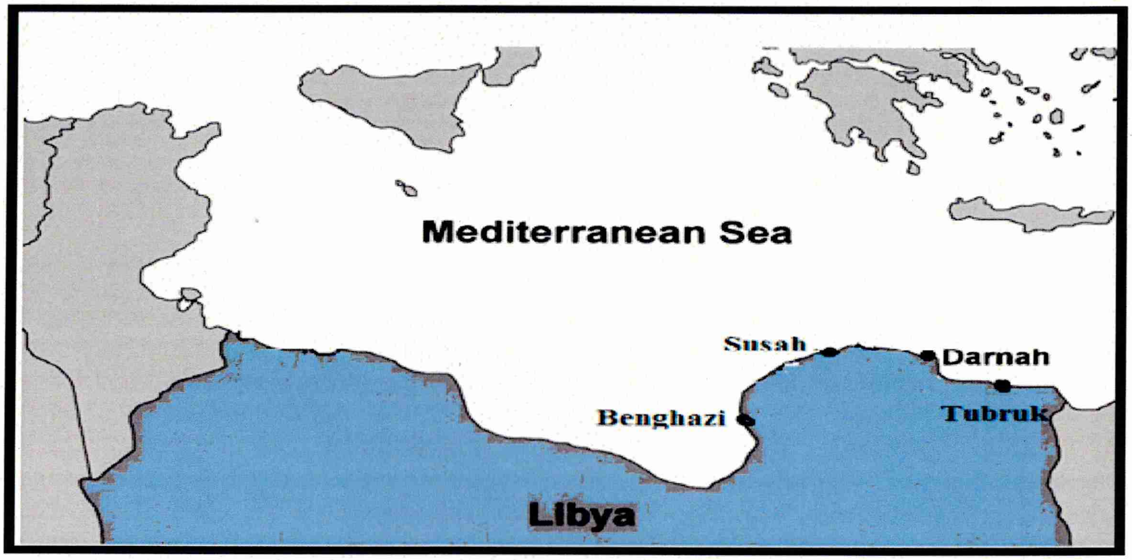


Figure 7.4: Map of the four fishing harbours at the study area located on the eastern region of Libya. Modified From M. Milanese et al. (2008:91).

7.6.2 Sample size and characterisation of the study sample

Selecting the sample population of fishing units depended on the type of boat due to the presence of several types of fishing boats, which differ significantly in terms of size, type of fishing, target fish, horsepower, the number of fishermen on the boat among others. The population of interest was all artisanal and semi-industrial fishing boats in Eastern region of Libya during 2011. It was important to try to represent the range of fishing boats used in terms of size, power, number of fishing crew, the type of fish targeted etc. To do this, a stratified random sampling scheme was developed.

According to the Marine Biology Research Centre (2008) the number of boats in the eastern region of Libya was 426 boats. Three types of boats were in use: Flouka, Motor (these first two are known as the *artisanal fishing fleet*) and Jarafat (known as the *semi-industrial fishing fleet*). These distinctions are defined further by Abukdair and Zargani (2005): the first types are the Flouka boats, which are between four and seven metres in length, carry a crew of between one to four, and fish using nets and snares close to the shore/coast. The second motor boats are between 5 and 12 metres in length, carry a crew of between three and seven, and fish using nets and lines. Finally, Jarafat boats are larger, carry a crew of between 11 and 16 and use special nets (see Table 7.3). In this study, the types of boats are divided into two categories which are: small boats locally known as 'Flouka', (n=264) ranging between 12-48 Horse Power (HP) 62% of the fishing fleet size and large boats known in the study as 'Motor' (n=147) and Jarafat (n=15), while Motor 34% and Jarafat 3%, ranging between 60-250 HP (Table 7.3).

Table 7.3: Type of Fishing Boat in the Eastern region of Libya

Type of boat	Number of boats
Flouka	264 (62%)
Motor	147 (34%)
Jarafat	15 (4%)
Total	426 (100%)

Source: Marine Biology Research Centre (2008) - Tajoura - Tripoli

Israel (2012) stated that at ±7% at precision levels, a sample size of 138 is an adequate representation of population above 425 to 449 (see appendix C table for determining sample size). Unlike when sampling from a large populations, a finite population correction is required to determine the precision of estimation that a specific sample size will provide (Penn State Eberly College, 2015).

The issued sample size was 138 boats and the final achieved sample size was 111 boats - a response rate of 81%. As aforementioned in section 7.2.1, stratified sampling method was used to conduct the field study after determining the size of the sample of 426 fishing boats in the study area, located on the east coast, stretching from the Libyan Benghazi area up to the border with Egypt to the east. Using the distribution of the sample between the layers is a selected sample size of each type of boat:

Small boat 'Flouka' = 264/426* 138 = 85

Large boat 'Motor and Jarafat' = 162/426 * 138 = 53

The researcher merged the larger two types of boats (motor and Jarafat) because there are so few Jarafat boats in the population as indicated by the sample.

Table 7.4: sample of fishing boats in the study

Type of Fishing Boat	Population	Issued Sample	Valid (Completed)
Small boat 'Flouka'	264	85	77
Large boat 'Motor and Jarafat'	147+15=162	53	34
Total	426	138	111

Researcher's Own Analysis

The survey lasted for four months from September 2011 to the end of December 2011. In all, a total of 138 questionnaires were administered but 122 were retrieved. Eleven out of the 122 questionnaires retrieved were invalid due to incomplete responses. The survey ended up with 111 valid questionnaires 88% returned, 80% returned and complete.

7.6.3 Developing the fish production questionnaire

This section was developed bearing in mind Porter's factor condition determinants as indicated in section 5.2. These factor conditions are further grouped into four parts.

PART I - Details of fisherman: This part of questionnaire consists of eight questions which are about socioeconomic characteristics of fisherman. These included: age, nationality, educational level, certificates from the field of marine fisheries, experience, satisfaction with fishing career, other sources of income and the existence of co-operative societies in the profession of fishing. In this part, all of the questions were closed.

PART II - Details of type of boats, fishing methods, and quantity of fish: This part includes questions about: type of boat, number of fishermen working on the boat, approximate average production per year, whether fishing is a profitable occupation, and fishing methods used.

PART III- Production and marketing: This part gathered data on the best season for fishing, fish marketing channels and problems facing fishermen.

PART IV – Government policies toward fisheries: This part gathered data about government policies toward the marine wealth sector, satisfaction with the role of government in the fishing industries, facilities and assistance provided by the state to fishermen, government's role in the fisheries sector. Recommendations were also sought on the state of the industry. See Appendix D for English and Arabic versions of the fish production questionnaire.

7.6.4 Developing the fish production interview

As mentioned in section 7.2.2, in order to gather more in-depth information on fish production, two fishermen were interviewed. The interview consisted of open questions designed to elucidate commentary about personal experiences of the fishing industry. This interview covers the whole processes of fishing from the harbour to the final consumer. (See appendix E interview cover sheet and participant consent form, and see appendix G for English and Arabic versions of the fish production interview).

7.6.5 Distribution (Marketing)

To explore the structure of the fish market in the eastern region of Libya, its specifications, general problems and the role of government, structured interviews were used. One fish wholesaler (in-depth interview) and eight vendors of fish were interviewed (structured); then two of the eight fish traders with long experience in the marketing of fish were chosen to be interviewed (semi-structured) in order to identify the fish market in the eastern region in more depth and detail. The interviews have added to the data related to fish marketing. Appendix F contains English and Arabic versions of the fish distribution interview.

7.7 The Demand Side of the Case Study

The second side of the case study is concerned with the demand of fish, its current situation and arrangements for its improvement. It also covers local fish consumption and export to neighbouring countries.This section discusses the selection of the study areas and the sampling procedures used to retrieve data.

7.7.1 Selection of the study areas

Figure 7.4 shows the cities selected as study areas for this thesis. The chosen cities were: Benghazi, Tobruk, Albeida and Shahait (Cyrene). All four cities are in the eastern region of Libya. Two cities are located on the coastline, Benghazi and Tobruk, while Albeida and Shahait are inland cities. The city of Benghazi overlooks the coast on the Mediterranean Sea in eastern Libya. It is an important economic centre and the second largest city after the capital city, Tripoli. The city of Tobruk is the gateway to eastern Libya from the Egyptian border where the distance between Tobruk and Egypt is 150 km. Tobruk is an important centre for trade and markets. The city of Albieda is in the north-east of Libya and is one of the major cities and the second largest city in the eastern region and the most important after Benghazi. It sits on the highest peak of the Green Mountain. Shahait (Cyrene), which is the Greek name of the city of Shahait, is one of the most historically important cities in the Province of the Green Mountain. It is the second largest city after the City of Albeida on the Green Mountain. It is known for its ancient Greek historic ruins.

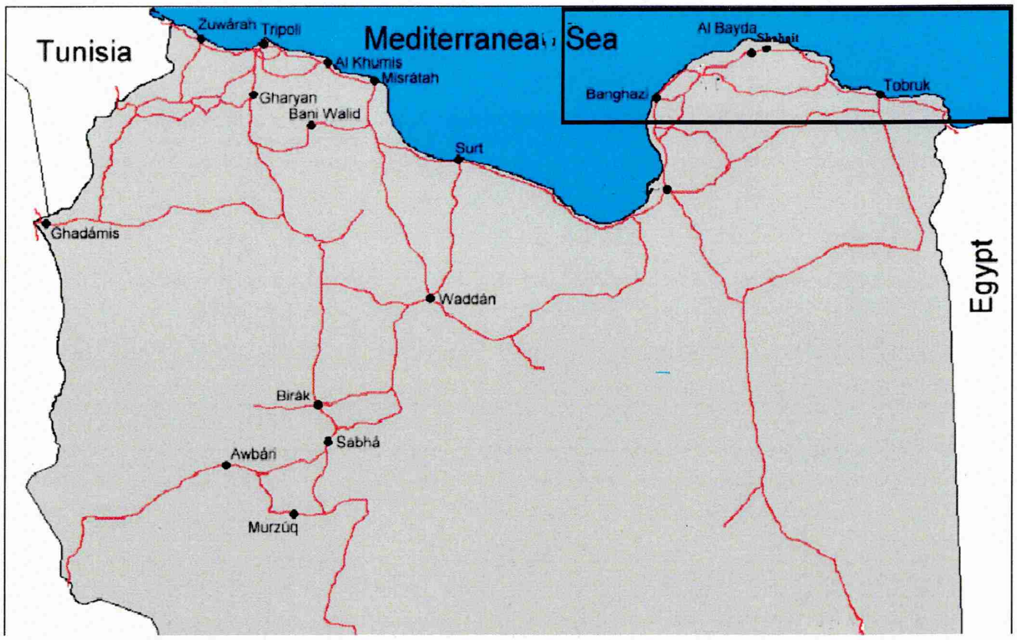


Figure 7.4: Map of Libya showing the four selected cities of the study in the eastern region, Source: Google maps modified by researcher

7.7.2 Selecting a sample of consumption

This part of the research builds on fieldwork conducted during the period of September to December 2011 to understand consumer behaviour toward fish consumption. The main sources of data collection were the heads of the households and the tool of data collection was the questionnaire survey. Data were obtained through self-administered questionnaires. The study objective in this part of the research is to understand consumer behaviour in the eastern region of Libya toward the choice and purchase of fish. The researcher selected the sample on the basis of family households and then the head of the family household was selected. The reason for the selection of families rather than individuals is that the number of families, of course, would be less than the number of individuals in society. This will make the sample smaller and more convenient for the researcher due to time. Israel (2010) stated that at five per cent precision levels, a sample size of 400 is an adequate representation of population above 100,000. In this case, the totals of number of households were estimated at 102,494 (Civil Registry in Benghazi, Albeida, Shait, and Tobruk 2011). The adequacy of sample size 400 households can be found in Table 7.5. The sampling table used is available in appendix C.

A cluster sample was used to study local fish demand. The sample sizes were selected from four cities in the eastern region of Libya to explore patterns of local demand. The number of households in the city of Benghazi is estimated at 71,642 (Civil Registry in Benghazi, 2011), and the sample selected was 280 households. The number of households in Albeida city is 15,694 (Civil Registry in Albeida, 2011), and the sample selected was 60 households. The number of households in the city of Shahat (Cyrene) is 4088 and the sample selected was 16 households. The number of households in Tobruk city is 11,070; and the sample selected was 44 households.

Table 7.5: The Number of Household in the Sample

City	The number of households	Per cent (%)	Sample
Benghazi	71,642	70%	280
Albeida	15,694	15%	60
Shahat	4,088	4%	16
Tobruk	11,070	11%	44
Total	**102,494**	**100%**	**400**

Source: Civil Registry in Benghazi, Albeida, Shait, andTobruk (2011)

The researcher had to make a decision about the most suitable measuring unit (the main source of data) – the head of the household or any other member of the family. The decision was made that the sample constitutes the heads of the families. The reason for this choice is that the researcher coming from Libyan society is aware that decisions of food purchase are mostly taken by the head of the family for cultural reasons. Thus, he will be able to explain the reasons that led him to choose a particular type of food purchase and explicate his view on such reasons. In all, 595 questionnaires were distributed to the four selected cities (Benghazi, Albeida, Tobruk, Shahat) taking into account the differences in population size between the four cities during the distribution process. Out of the 595 questionnaires distributed, 432 were retrieved and only 400 turned out valid and were analysed as an adequate representation of the research population (Israel, 2010). The researcher used drop-off / pick-up method to distribute the questionnaire in centres like clinics, public and private schools and university to help get the data Kaynak et al (2005: 39).

7.7.3 Developing the food choice questionnaire

The Shepherd (1985) model implemented in this research study is justified in chapter five. First, this model includes almost all the factors involved in making the final decision for consumer's food choice. Second, the model shows the interaction between the factors that categorise food choice factors in a simple and clear way, which eventually result in the consumer's food-choice decision. In this study a questionnaire was used to collect the following data on fish consumption:

- Gaining an understanding of the variety of important factors influencing fish consumption.
- Identifying some aspects of consumer behaviour toward fish which are related to the acceptance or rejection of fish meals.
- Understanding attitudes and beliefs towards the consumption of fish.
- Identifying the forms and different types of animal protein in the meals and the place of fish in this system in eastern region in Libya.
- Drawing comparisons between fish and other types of protein from consumer perspectives.
- Comparing patterns of fish consumption in coastal and inland areas.

Overall, the study aims to seek the cause of the large decrease of the average per capita of fish consumption despite the importance of fish to health and food security in particular, and economic diversification of Libya in general. The questionnaire consists of two parts: the first part includes four sections and the second part contains two open questions.

PART I

1- Section A consists of seven questions which are about demographic factors of consumers (age, gender, educational level, family size, number of children under the age of 16 years, a level of income). Previous studies demonstrated that there is a relationship between demographic factors for the consumer and his selection of food (see separate review on p.204-205). Shepherd (1989) also mentioned that demographic factors may affect the selection of food, although he did not put them in his model. These questions were intended to test whether demographic factors have an impact on fish intake or not.

2- There were 10 questions in Section B. These questions focused on social and cultural habits of the consumer. Questions 9 to 11 asked about food consumers' habits in terms of the type of protein they usually eat, and the type of protein that is preferred for the inhabitants of their city. Questions 12 to 16 focused on fish consumption which is the goal of this research. Questions 12-13 ask whether participants eat fish or not, followed by a question to understand the reasons that make the consumer not eat fish. Question 14 is considered as a dependant variable in the consumption part of the research. The question is: How often do you eat fish?

Question 15 asked about types of fish species that consumers eat, even though the answers derived from this question did not directly address the research questions, it has been useful in understanding the fish species preferred and commonly consumed by residents (see Table 9.2), and could also be helpful in marketing strategy. .In question 16, heads of households was asked if they eat processed (canned) fish. Categories for this question include Tuna, Sardines, Salmon, all of them, others. Question 17 was about any cultural barriers to preparing fish meals for your guests. If the respondent ticked yes, he was asked to specify the causes in question 18. The rationale for questions 8 to 18 was to find out the impact of dietary habits and culture on eating fish as well as identifying the reasons for not eating fish. In addition, it was to find if there are cultural barriers preventing consumers from buying fish and the frequency of fish consumption in eastern region.

3- There were four questions (19 to 22) in Section C. These questions focused on psychological factors and beliefs. Participants were asked about convenience of fish meals preparation, the relationship between eating fish and mood, beliefs regarding eating fish and keeping healthy, and the knowledge about the nutritional value of fish. These questions were put in a direct and simple form.

4- Section D is made up of three questions. Questions 23-24 asked the heads of households about economic factors; affordability of the fish price on participant income, and the availability of the stores that sell fish where participants live. The questions were closed ended with two choices: Yes or No. In question 25, the researcher tried to give the respondents a chance to show the importance of the following factors in influencing their decision to buy fish: quality, taste, nutritional value, convenience (preparation), availability, price and health. This question was based on a six-point scale, the scale points vary between scale codes ranging from 'very important' to 'not at all important'. Numerical values varying from 1 to 6 were assigned to the scale codes.

PART II

This part of the questionnaire was designed to include all the factors addressed in the model suggested by Shepherd (1985). Shepherd (1985) in his model stated that psychological factors may also have an impact on consumers' behaviour in selecting food. There were two questions in this part. These questions were open questions to give the participants an opportunity to express their personal reasons. The first question was about the obstacles that prevent fish from being an important meal in Libyan society. The second open question was about suggestions that may help to make this type of protein more important in the Libyan diet. The rationale for these questions was to find out more about reasons which might prevent fish consumption therefore providing a further understanding of the factors that affect fish consumption. In addition, the consumers' suggestions may help us find out how consumers' believe they could meet these obstacles therefore increasing the contribution of fisheries to food security and consequently to economic diversification (see appendix H).

7.8 Interviews

Interviews are very extensively used in social research (Robson, 2002). The qualitative interview method is very helpful in collecting opinions and information from experts through the early stages of research (Walliman, 2006). According to Hesse-Biber,and Leavy (2011:98), conducting "interviews offers researchers access to people's ideas and thoughts in their own words rather than the words of the researcher". Therefore, interviews have been useful in gathering reliable data that relate to objectives and research questions.

There are different types of interview, namely: structured, semi-structured, unstructured interview and focus group (May, 1997; Robson, 2002; Walliman, 2006). According to Newton (2010), the different interviews can be conceptualised as existing as continuum with two poles namely; unstructured which is closer to observation and at the farther end the structured which is close to the questionnaire. There are different purposes for using each type; in this respect, there are links between research purpose and strategy of research. Cohen et al. (2000) argue that the research interview serves three main purposes. Firstly, it can be used as the principal means of gathering information.

Secondly, it can be used to investigate a hypothesis, to suggest new questions or objectives or as an exploratory device to help identify variables and relationships. Thirdly, it may be used to triangulate with other research methods to follow up unexpected results, validating other methods and exploring the motivation behind and reasons for participants' responses. In this research, the interview was considered as the secondary method for collecting additional data to the questionnaire. Interviews were done in two phases for two distinct reasons; the first phase was done with key informants like the Minister of Agriculture at the beginning of the study. The main purpose of these interviews was to get a broad picture of the sector from the highest policy maker in the sector. The second phase was done in the final stage of the study and was largely for triangulation with other research methods. The main purpose of these interviews was therefore to validate the data collected through other methods. Both semi-structured and structured interviews were designed to achieve this goal. According to Harrell and Bradley (2009) the difference between the two lies in the kind of questions and the process of operationalising the questions. For the semi-structured interview the interviewer uses a guide which outlines the questions to be answered and the topics to be covered.

While the questions are standardised, the interviewer has some freedom to probe and decide the order of asking the questions with each interviewee. Thus semi-structured interviews allows for collection of detailed information in a conversational way. They are therefore useful for in-depth study of a topic allowing for collection of rich data. On the other hand, the questions in a structured interview are usually fixed, identical and are asked in a strict order for each of the interviewees. Moreover, there is no room for the interviewer to probe the respondents thus making structured interviews to be considered as an adapted read aloud format of survey. Nevertheless, structured interviews have many advantages over survey key amongst them being the reduced rates of non-responses and the opportunity it allows for the interviewer to temper improper responses. Clearly, the interviewer plays a key role in directing interviews (Ritchie and Lewis, 2003 and Gillham, 2000)) and thus the overall results in terms of the quality of data collected is heavily dependent on the communication skills of the interviewer (Clough and Nutbrown, 2007). Alongside communication skills like attentive listening, proper structuring of questions, and creating an enabling environment for the interviewees' free participation, interpersonal skills like ability to create rapport hinged on trust with the interviewees is also key for successful interviewing(Cohen et al., 2007; Opie, 2004; Newton, 2010). In this study questions were developed through reviewing the literature, considerations derived from the theoretical framework and findings from the exploratory study. More questions emerged while interviewing participants; therefore the collected data was rich and sufficient to draw a clear picture of the nature of the interaction between determinants of development the fisheries sector in Libya.

7.8.1 Interviews' sampling

Patton (1990) cited in Hoepfl (1997) argued that there is no definitive criterion for sampling in qualitative research. According to Ladner (2008) how many is not an issue, the important thing he argues, is being able to understanding the phenomenon enough. Besides the lack of standardised sampling methods in qualitative research, some general sampling issues must be considered in qualitative research. Onwuegbuzie and Leech (2007) highlighted and discussed three essential issues concerned with it: representation, legitimation and praxis. Representation is related to the difficulty of selecting a representative sample of lived experience. Legitimation is consideration of validity, generalisability and reliability. In order to discuss the size of qualitative samples issue, Onwuegbuzie and Leech (2007) for example, opined that in qualitative research the ultimate size of the sample should be driven by the desire to extract rich data. As a result, the adoption of a large sample would not present a sufficiently detailed understanding of the studied situation. Yet Gaskell (2000) argues that size of sampling is influenced by the nature of the examined situation and the availability of data sources. The term 'data saturation' is used with a wide range of meanings since the majority of qualitative researchers refer to it as an indication of adequate sampling, while others use it to confirm data saturation (Francis et al., 2010). In this case and during the fieldwork, the researcher reached a saturation point in data collection when she realised that no new or relevant information is emerging from the interviews. Instead, the response already received from the questionnaires and previous interviewees appears being repeated by subsequent interviewees. At this point it was decided that no more interviews need to be conducted. The analysis has shown that the responses so far gathered through interviews have adequately complemented questionnaire findings.

Mack et al. (2005) state that there are three approaches to sampling for qualitative research, they are: quota, snowballing and purposive sampling. In quota sampling, the researcher decides when designing the study how many people with which characteristics to include as participants. Characteristics might include age, place of residence, gender, class, profession, marital status, etc. Snowball sampling is well suited for a number of research purposes and is particularly applicable when the focus of study is on a sensitive issue, possibly concerning a relatively private matter, and thus requires the knowledge of insiders to locate people for study. Finally purposive sampling is one of the most common sampling strategies adopted by qualitative researchers. Groups' of participants are selected based on a series of predetermined criteria, relevant to a particular research question. Mack et al (2005) indicate that "Sample sizes depend on the resources and time available, as well as the study's objectives".

Purposive sample sizes are often determined on the basis of theoretical saturation (the point in data collection when new data no longer bring additional insights to the research questions). The purposive sampling technique, also called judgment sampling, is the deliberate choice of an informant due to the qualities the informant possesses. It is a non-random technique that does not need underlying theories or a set number of informants. Simply put, the researcher decides what needs to be known and sets out to find people who can and are willing to provide the information by virtue of knowledge or experience (Bernard 2002, Lewis and Sheppard 2006).

Johnson and Onwuegbuzie (2004: 20) argue that, "a tenet of mixed methods research is that researchers should mindfully create designs that effectively answer their research questions". In this study, quantitative method was identified as the central approach and was used to explore determinants of competitive advantage in the fisheries sector. It was however necessary to compliment the quantitative methods with qualitative methods specifically this was to enable the researcher elaborates further on the factors that affect fish production and consumption in eastern region in Libya. As a result, Purposive sampling was adopted in this study.

Participants were selected on the basis of their ability to give information needed by the researcher. Purposive sampling was adopted to select the participants who included Libyan Government official in FAO, government official, expert in marine research centre, fishermen, retailers, and wholesaler. The participants were selected at the discretion of the researcher making the process efficient in terms of time and resource input (Black, 2010). The 'free hand' given to the researcher on choice of participants however results in liability concerns; since it makes the process vulnerable to biasness. However, this concern is taken care of since the interview method was also triangulated with other methods; questionnaires, government and non-governmental documents, resulting in the moderation of any disadvantage of previous method and mitigate against the aforementioned weakness.

7.8.2 Sampling phases

The researcher defined three essential aspects which should be taken into account in the sampling process. These factors are: supply chain, academic position, civil service position (see Figure 7.5). Each one of these aspects led to further considerations. For example, supply chain led to selecting three different episodes of the chain; fishermen, wholesaler and retailer. Academic position led to selecting people in different academic positions such as: expert from marine research centre and expert from food and agriculture organization FAO. Finally, civil service position led to the selection of the minister of agriculture as a respondent.

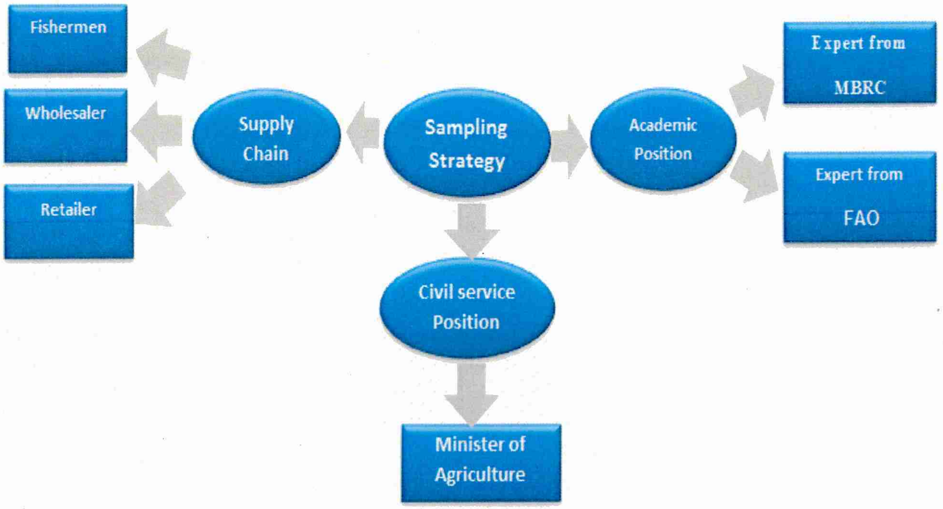

Fishermen
Wholesaler
Retailer
Supply Chain
Sampling Strategy
Academic Position
Expert from MBRC
Expert from FAO
Civil service Position
Minister of Agriculture

Figure 7.5: Interview's Sampling Strategy

In addition, table 7.6 contains example of data gathered through interviews, and Appendix F contains English and Arabic versions of the interviews and samples of the interviewees.

Table 7.6: Research Participants in Research Interviews

S/NO	Sources of Data Used	Data type	Suffix
1	Expert from FAO	Interview transcript	FAO$_1$
2	Minister of Agriculture	Interview transcript	GR1
3	Expert from Marine Research Centre	Interview transcript	EMC
4	Fisherman	Interview transcript	FM1
5	Fisherman	Interview transcript	FM2
6	Fish retailers	Interview transcript	N(1-8)
7	Fish wholesaler	Interview transcript	WS1
8	Fish retailer	Interview transcript	RF1
9	Fish retailer	Interview transcript	RF2

7.8.3 Stages and timeline of the interview process

Extant literature outlines that the process of collecting qualitative data through interviews proceeds through a number of stages. Ammerman (1998) for example, divides the process into four mains stages namely; a preparation stage which entails deciding on type of interview to be carried out and collecting and reviewing of preliminary data about subject of study or even participants; the next stage involves making the interviewees feel at ease and helping them understand the aims and purpose of the study; conducting the study which is informed by the type of interview and questions in his consideration is the third stage and this he posits is followed by closing of the interview (the final stage), which should include aspects like debriefing and thanking the participant for their support and input. In addition to the data collection methods carried out for gathering data regarding the two sides of the case study, and in order to explore the effect and role of fisheries in the government's economic and social development plan, including how fisheries contribute to food security, the researcher interviewed the following individuals:

1- The First stage was in 2010

In-depth interview was conducted face-to-face with the Minister of Agriculture; there was a need to gain official information from the representatives of the government in the fisheries sector to get comprehensive picture about the fisheries sector from the government official, both in terms of the current state of the sector and the difficulties faced by the sector, and future plans for the sector. In summary, the researcher sought the Minister's views and recommendations of the extant state and future development of the fisheries sector. From 25th of July to 10th of September 2010 the researcher travelled to Libya and paid a visit to a number of institutions including the Marine Research Centre. During her visit to the research marine centre for example, the researcher met with some of the country's marine experts this was to help her get recommendations and help in getting a suitable person to accompany her in her field work. The researcher also took opportunity during the visit to gain access to the Marine centre's Library. Later on, the researcher proceeded on to visit the National Foundation for Maritime Investment.

2- The second stage was from 9/2011 to 12 /2011

Face-to-face interviews were conducted with artisanal fishing fleet to gain a more in-depth insight into their feelings and opinions about fisheries. Informal conversations were also made and documented with some fishermen who are not part of the fleet but are part of the fishing value-chain including vendors and retailers. In line with Opdenakker (2006), this kind of strategy allows researchers to understand social cues such as body language and tone of voice as positions are expressed. The findings of the majority of the 111 questionnaires which included open questions helped identify subsequent points to be focused on and confirmed as well as the data that needed more in-depth exploration. This informed the researcher's decision to interview some fishermen. Both semi-structured and structured interviews were designed and conducted. The semi - structured interviews was best because the researcher may not get more than one chance to interview them due to the conflict situation in Libya at the time of conducting the fieldwork. Two fishermen were interviewed in this manner: one fisherman from Benghazi port and another one from shush. Similarly, two fish retailers were interviewed in a semi-structured manner: one from Benghazi port and the other from Albeida. One fish wholesaler from Benghazi also formed part of those interviewees given the freedom to express their views and opinions in their own terms and understanding of the Libyan system. After interviewing the above who to a large extent have fishing experience, the researcher realised that 'data saturation' was in evidence, especially when the researcher compared the information from the interview and the ones gathered through previous formal interviews and informal conversations. According to Saumure and Given (2008), data collection is considered to have reached saturation when no new data or valuable information in terms of the subject of inquiry becomes apparent from subsequent interviews. It is normally considered as a signal of 'exhaustion' of all the valuable data and thus sign for stopping the data collection process. On the aspect of structured interview, identified respondents whose consents were obtained are provided with appropriate response categories to choose from for each question. Interviews were conducted with eight fish retailers: two each from Benghazi, Darnah, Tubruk and Albeida. The researcher chose these candidates on the basis of their length of experience in the field of fisheries retail and familiarity with their community. In the marketing aspect, the researcher found it difficult at first as most employees in the stores are not native labour, and it became very obvious that they were reluctant to speak freely in the absence of the owner. To solve this problem, the researcher decided to interview only the owners of the fish shops. This was an exploratory mission followed up by formal request for interviews. However, due to unavailability of owners of fish shops, the researcher had to make numerous visits that consequently increased the number of those interviewed to eight. All the above interviews with fishermen and vendors were conducted in their places of work i.e. along the harbour. The interviews were digitally recorded and the recorded data was transcribed (a written account of interview questions and answers), which was later analysed and integrated to the results from other methods.

3- The Third stage was in March 2012

a) Structured interviews with a) research expert at the Center for the Marine Biology, Tajoura-Tripoli; b) a government official of Libya at the FAO. Where it was not possible to carry out face to face interview; online interviews were made, particularly with marine experts at the Marine Biology Research Centre and at the Food and Agriculture Organization (FAO). The expert of Marine Biology Research Centre (MBRC) was chosen because he was the only economist in the institution. The interview was conducted via email, and it generally sought to gather detailed and specialised information and opinion of the expert on Libya's fisheries sector. The specific topics of inquiry included fish stocks and sustainability, the appropriateness of the country's maritime legislation, the problems facing the fisheries sector and the general needs of the sector. After the interview, the researcher maintained email contact with the expert during the study period with the sole purpose of getting updated reports and data of the sector from the expert. The researcher also had an interview through email with a representative from FAO. The main objective of this interview was to get clarity of the current global situation of the fisheries sector and to get the FAO's representative expert opinion and recommendations on how best Libya can deal with the problems of its fisheries sectors' and the strategies the country can employ to make the best of the sectors' 'wealth.' Table7.7 shows research methods and timelines.

Table 7.7: Research Methods and Timelines

Research Method/Tool	**Date of Administration**
Interview with government official (GR1)	20/4/2010
-All questionnaires - Interview with fishermen, vendors	From 9/2011 to 12 /2011
online interview with expert	8/3/2012
online Interview with Expert from FAO	19/3/2012
Notes: data collection was on-going throughout the research process by contacting the experts and government officials via email and telephone.	

7.9 Data Analysis and Testing

7.9.1 Analysis of quantitative data

Denscombe (2010) argues that the aim of data analysis is to obtain a better understanding of it through description of its elements, explanation of its works and interpretation of its meaning. Five main stages of data analysis are suggested by Denscombe (2010: 240) "which include data preparation, initial exploration of the data, analysis of the data, presentation and display of the data, and validation of data". The stages of data analysis for this research began by following a procedure similar to that stated by (*ibid*). The steps involved in the process included:

1. Data preparation
2. Quantitative analysis methods and interpretation of qualitative data
3. Reporting and presenting the data

7.9.2 Analytical techniques

The data was statistically analysed by using appropriate software packages for Social Science (SPSS) software version 19. The key was to identify significant factors that affect fish production and influenced the fish consumption behaviour in the Libyan context.

- Descriptive statistical analysis was used to identify percentages and frequencies.
- Pearson's Chi -square (χ^2) test was used to see whether there is a relationship between some of the quality variables and frequency of fish consumption. A

statistical relationship is said to exist between the variables under consideration if significance is less than 0.05. In addition, Cramer's V statistic was used; this test takes values from a minimum of 0 to a maximum of 1; and the closer the statistic is to 1, the stronger the association between the variables (Field, 2009); Chi-square test was applied by using SPSS software to both production and consumption of fish.

- The logistic regression model was used to analyse the quantitative data in the fish consumption side, having identified the variables that had a statistical relationship with frequency of fish consumption binary logistic regression analysis was conducted to further examined to predict how those variables affect the frequency of fish consumption. "Multivariate analysis was conducted based on binary logistic regression modelling; this model is often used to predict a categorical (usually dichotomous) variable from a set of predictor variables". (Pallant, 2010; Wuensch, 2011 cited in Daniel, 2014: 168). "Regression methods have become an integral component of analysing data concerned with describing the relationship between a response variable and one or more explanatory variables" (Gabrielsson and Weiner, 2001: 835) .

7.9.3 Qualitative analysis

The stages of data analysis for this research began by following a procedure similar to that stated by Denscombe (2010). Qualitative analysis was used to analyse interviews and documents. The steps involved in the process included:

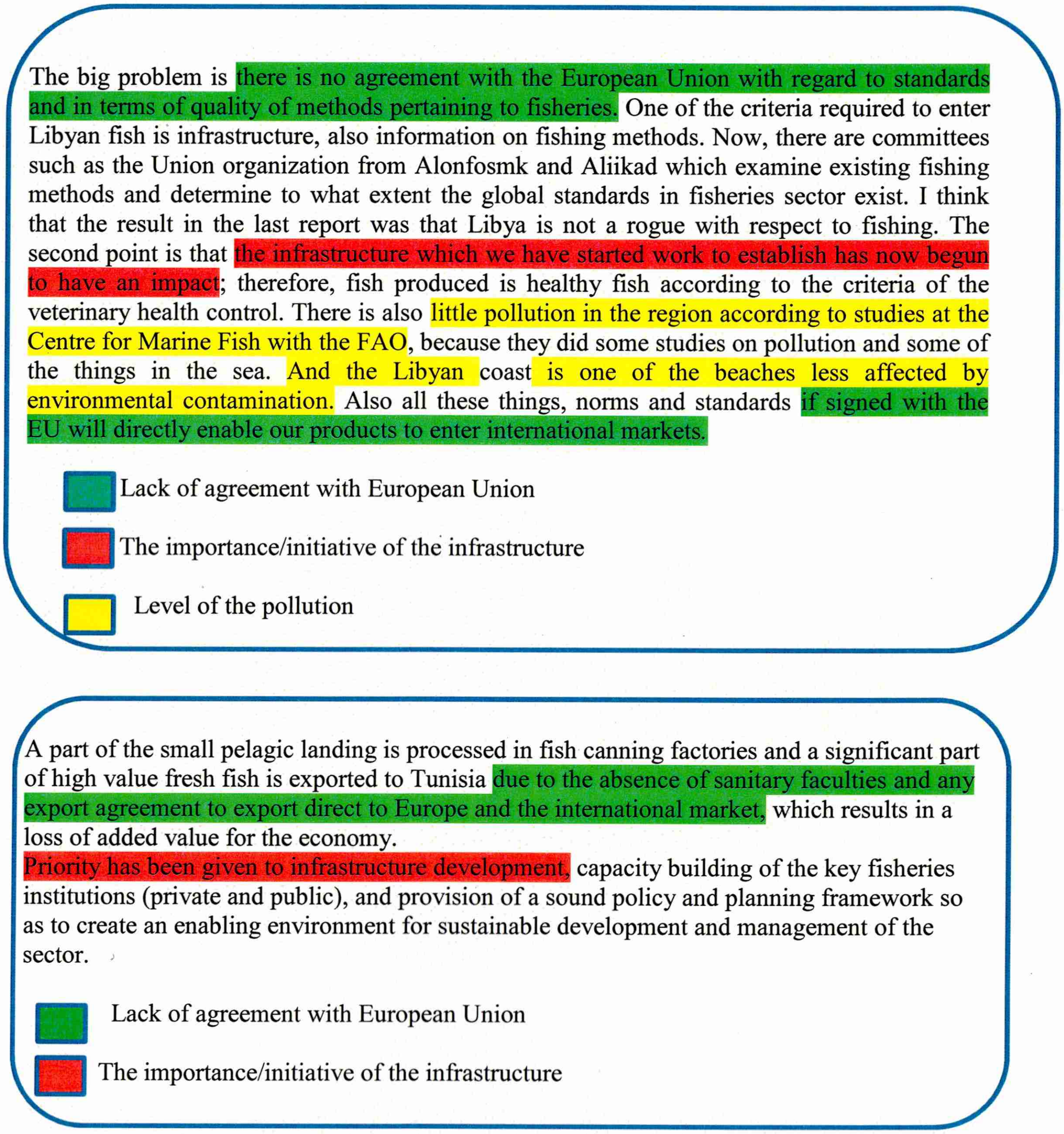
1. Data preparation
2. Preliminary analysis including documents analysis
3. Interpretation of qualitative analysis
4. Reporting and presenting the data

Qualitative data followed the following steps:

Transcription: Once the interview transcripts and documents were translated, the qualitative data was transcribed by the researcher, and then rechecked by certified professional translator.

Coding the data: According to Kvale (2009:105): "Coding involves attaching one or more keywords to a text segment in order to permit later identification of a statement". Statements related to specific aspects of the research were highlighted by colours; in other words, statements which were related to addressing the determinants of diamond model and research questions. The qualitative data were coded according to concepts which were thought to triangulate with the quantitative data. The coded texts were then grouped and categorised according to their similarities and differences (see Figure 7.6) which means all categories that are related to one thing were put together and again the process of categorisation was based on the research questions.

The final stage, involved summarising and interpreting data. To provide better understanding of the data, summaries of key issues and quotations from respondents' statements were included in the interpretation and discussion of the data.



The big problem is there is no agreement with the European Union with regard to standards and in terms of quality of methods pertaining to fisheries. One of the criteria required to enter Libyan fish is infrastructure, also information on fishing methods. Now, there are committees such as the Union organization from Alonfosmk and Aliikad which examine existing fishing methods and determine to what extent the global standards in fisheries sector exist. I think that the result in the last report was that Libya is not a rogue with respect to fishing. The second point is that the infrastructure which we have started work to establish has now begun to have an impact; therefore, fish produced is healthy fish according to the criteria of the veterinary health control. There is also little pollution in the region according to studies at the Centre for Marine Fish with the FAO, because they did some studies on pollution and some of the things in the sea. And the Libyan coast is one of the beaches less affected by environmental contamination. Also all these things, norms and standards if signed with the EU will directly enable our products to enter international markets.

🟩 Lack of agreement with European Union

🟥 The importance/initiative of the infrastructure

🟨 Level of the pollution

A part of the small pelagic landing is processed in fish canning factories and a significant part of high value fresh fish is exported to Tunisia due to the absence of sanitary faculties and any export agreement to export direct to Europe and the international market, which results in a loss of added value for the economy.
Priority has been given to infrastructure development, capacity building of the key fisheries institutions (private and public), and provision of a sound policy and planning framework so as to create an enabling environment for sustainable development and management of the sector.

🟩 Lack of agreement with European Union

🟥 The importance/initiative of the infrastructure

Figure 7.6: Coding Qualitative Data

7.9.4 Validity and Reliability

The scales used in this research were adopted from validated preceding studies. That notwithstanding, given the unique context of the study, the researcher paid careful attention to aspects related to the validity and reliability of the research instruments. Appreciating that validity and reliability measurements are core determinants of every research's authenticity (Hair et al., 2010), the researcher paid specific attention to each of the measures particularly in regards to the designing, construction and eventual use of the research instruments. The aspect of validity is a key concern for both qualitative and quantitative researchers (Ali, 2011). One aspect of validity which is referred to as construct validity is concerned with the extent to which the items in a research instrument can effectively measure what it is purposed to measure as determined through the main study objectives.(Bryman and Bell, 2007; Sweis et al., 2014, p179). To ensure construct validity, the researcher designed the interview and questionnaire based on concepts identified through extensive literature review which was guided by the study's key objectives.

The other aspect of validity which was of equal concern to the researcher was that of content validity of the research instruments. Content validity is concerned with the quality of the questions in the research instruments. In seeking to establish the content validity of the instruments, the researcher presented her designed yet to be used instruments to experts including her research supervisors, persons with expertise in survey design in Sheffield Hallam University and Libyan academic staff in Omar Al-Mukhtar University. The experts provided feedback on among other things, relevancy, clarity and conciseness of the questions (Bornstein. et.al 2015). This process that involved the experts constitutes part of the pre-testing procedure for the instruments. According to Dekeba (2011), pre-testing during a study involves piloting an aspect of a study for example the method of data collection or a data collection instrument. Through pre-test, one can establish the suitability of content of instrument or proposed method and the relevancy, clarity, adequacy and appropriateness of the questions and general flow and structure of the instrument *(ibid).* Pre-testing was divided into two stages: in the first stage, the initial drafts of the questionnaires (both for consumer and fishermen) and interview in English were revised and modified by the research supervisors and specialists in survey methods and data analysis in Sheffield Hallam University.

Comments for improvement were received from them in respect to the structure of questions, wording and its formats. This as discussed in the preceding section was to enhance validity and helped to make necessary alterations prior the second phase which was in the form of a field pilot study (Saunders et al., 2009; Hair et al., 2010). Further validity was ensured through the triangulation of the findings using different methods in the study.

7.9.5 Reliability

Reliability of a study is concerned with the replicability of the study. Specifically it is concerned with the extent to which a study's instrument or measurement scale can produce the same results if applied in a different but similar study (Ritchie and Lewis, 2003; Sweis et al., 2014). There are many of ways of assessing a study's reliability including through a test-pretest, intra-observer and internal consistency. In the case of this study, the researcher's supervisors acted as a reliability auditor throughout the study. They did this by amongst other things paying attention to the documentation of the researcher's process of inquiry throughout the study, examining to what extent the study design was theoretically driven and what mechanisms the researcher had put in place to minimise researcher's bias (Tellis 1997). In order to test the suitability and validity of the data, a pilot study was first conducted. According to Van Teijlingen and Hundley (2002:33-36): ''The term 'pilot studies' refers to mini versions of a full-scale study also called feasibility studies as well as the specific pre-testing of a particular research instrument such as a questionnaire or interview schedule''.

Additionally, a main goal of a pilot study is to test the validity and the suitability of the research questions. It was a chance for the researcher to gain a clear vision for research, and attain a more accurate estimation of timeframes and timetables that will be spent on data collection, a pilot study can also be as mentioned by Baker (1994: 182-3) "the pre-testing or 'trying out' of a particular research instrument." The questionnaires were piloted with ten consumers who live in Albeida city in the Eastern part of Libya and eight fishermen. The aim of this was to make sure that the questions were clear and unambiguous for the participants and also to ensure that the participants would be able to answer the questions. It was found that only two of the consumers could answer the question: 'What is the amount of monthly spending on fish? The rest of the consumers could not provide an answer. It could be understood that getting a respondent to estimate the monthly spending on a specific food product would not be easy. In addition, asking them for a specific cost is problematic due to the variations in prices (e.g. Shrimp, Sardines, clams etc). Hence, this question was dropped from the questionnaire. The remaining questions were all answered so it could be assumed that there would be no difficulties in answering the questions.

Overall, except for the two questions mentioned above, the pilot study participants were in agreement with the academic who were consulted prior to the pilot study. The feedback from both groups on the content of the questionnaires was positive in regards to relevance. Further, they also gave favourable feedback in regards to the questionnaire overall structure and clarity of the questions. As such, the two groups'(academic and pilot study participants) feedback assured the researcher of the content validity of the questionnaire, for according to Hair et al. (2010), judgement from stakeholders with expertise in the subject of study is considered as one of the most appropriate ways of ensuring content validity. Given this green light, the researcher proceeded to collect data using the updated version of the questionnaire.

7.10 Research Ethics

When conducting research with human participants, ethical principles need to be taken into account (Bryman, 2008). The research ethics of this study were guided by the ethical principles used at Sheffield Hallam University (Research Ethics Policies and Procedures, 2009, 2012) which are based on the standards of the Declaration of Helsinki and the ESRC Research Ethics Framework. These ethical principles include the following categories, which were closely considered throughout the different stages of the research: beneficence and non-malfeasance, integrity, informed consent, anonymity/confidentiality. Creswell (2009) identifies several ethical issues which are believed to arise during the different stages of undertaking research work and are parallel to the principles mentioned above.

Firstly, when identifying the research problem, the researcher should focus on issues that will benefit the people being studied. In line with this and to reflect beneficence, the participants were informed of expected benefits and what returns the study was hoped to achieve for them as individuals and for their country (see Appendices F, H and E). Non-malfeasance was also taken into account when revealing the researcher's identity to avoid deception. It was also ensured that participants were not to be exploited or harmed (Bryman, 2008) if they chose to participate in the study.

Secondly, Creswell (2009) argues that the researcher must clearly transmit the purpose of the research to participants, and avoid ambiguity of purpose. In other words, integrity must be attained prior to conducting any of the data collection methods. According to Denscombe (2010), participants should be made aware of the nature of the research and their involvement. Before administrating the interview, the participants were given a note about the aim and objectives of the research in the form of an information sheet which was constructed following the University's guidance (see Appendix F for informed consent form).

Thirdly, Creswell (2009) asserts that during the data collection stage, the researcher should ensure that the site of research is kept undisturbed, any unsafe information should be kept disclosed and the privacy of the participants must be respected and protected. Once again to ensure non-malfeasance and avoid negative reaction, research sites were approached in line with their regulations (related to permission, access, working hour, etc). Participants were approached at appropriate times; times which were convenient to them and when they were willing and ready to participate. Distressing questions or questions that may cause discomfort for participants were avoided and participants were given the right not to respond to any questions they so choose. They were assured that any adverse consequences will be detected and professionally dealt with immediately.

Fourthly, at the phase of data analysis and interpretation, the researcher took account of several ethical issues which include: protecting the anonymity of participants, their roles and any incidents which might occur in the project and assuring the accuracy of the interpretation. To obtain this, the research participants of this study were assured anonymity; their names and any information revealing their identities were removed from the collected data. Data from questionnaires and interviews were discrete and the contents of these were treated confidentially and were not mentioned or discussed with other participants. In addition, the researcher made every effort to ensure that research participants' voices were fairly represented. Data obtained from the interviews, were carefully translated and transcripts were revised and closely examined.

Finally, according to Creswell (2009), in writing and disseminating the research, the researcher should write in clear language without any harmful references to participants either by words or expressions, avoid any misuse of the results for the advantage of one group or another and finally provide details according to the research design to make sure the readers can determine the credibility of the study results. Once again this refers to how non-malfeasance was accounted for and these points were clarified in the information sheets and consent forms. The researcher resolved to make the research findings available to them upon request.

7.10.1 Positionality and limitations with data collection

Every researcher is deemed to approach a research study from a unique position informed by the researcher's world view on matters relating to the research task (Foote and Bartell, 2011). Ideally, it is considered that dual identities of the researcher as a person and as a researcher are inextricably linked making the research process subject to the researcher's personal bias. Given, this bias which is largely shaped by one's experience, latent knowledge and context of operation is inherent and multidimensional. It contributes to a researcher's general outlook towards things, choice of methodologies and questions and manner of asking the questions (Lucas, 2005). Clearly, a researcher's positionality speaks of his ontological and epistemological assumptions as well as his assumption on human nature and agency (Sikes, 2004). Given the experiential dimension of positionality, it has been observed that some aspects of positionality are subjective and contextual while other aspects are culturally shaped (Chiseri-Strater, 1996). The researcher worked in research department at Omar Al-Mukhtar University. Working in this department made her privy to experiences of many female researchers in conducting research across different nations a reality that made her conscious of possible difficulty in accessing her target population in her first phase of the study. Specifically, the researcher was concerned whether her female gender would affect the responsiveness of the male participants during the study. This 'fear' was based on evidence from extant literature indicating that female researchers faced some level of difficulty in working in societies that had a high degree of gender segregation like the Arab countries (Al-Turki and El-Solah, 1988). For example, female social scientists who have done fieldwork in purdah societies report an imposed limited access to the research community due to their gender. In effect their exploration is largely restricted to the world of women (Pettigrew 1981; Pastner, 1982).

Similar challenges have been reported in many studies carried out by women researchers investigating aspects of Arab societies (e.g Huasin, 1970, Ibrahim, 1979 cited in Al-Turki and El-Solah, 1988) which are rife with gender segregation. It should be noted, however, that foreign women researchers are usually not subjected to as strict segregation rules in the Arabic societies, thus in comparison to the native women researchers they are usually more mobile and are subject to more flexible rules (Al-Turki and El-Solah, 1988). A case in point is that of Eickelman (1984) who reports that her foreign status in a gender-segregated village in Oman allowed her to venture into the market, a freedom not readily accorded to the women in that society. Similar situations have occurred in rural Lebanon (Nader, 1970), Iraq (Fernea, 1965) and in Morocco (Dwyer, 1978). Specifically, Arab women researchers are known to be faced with serious challenges when carrying out research that requires the collection of field data. The aforementioned difficulty has been identified as one of the key hindrances for the development of women in the field of science (Asbar Center for Studies and Research and Information, 2007).

Clark (2006) carried out a study to identify the challenges of carrying out field research in the Middle East with particular interest in the obstacles and potential solutions to using qualitative methods. The results from his study indicated that gender aspect was more important than any other cultural differences; culture manifests itself most acutely in issues related to gender and that the political climate has the greatest impact upon field work in the region. His study also revealed the fact that being of female gender as a researcher was however helpful when the issues being studied related specifically to female gender, and or required interviews with women (Clark, 2006). This is attributed to the fact that due to gender segregation in many countries in the Middle East; men are largely barred from women's realms. In addition, the women in his study indicated that women in the Middle East are able to let their guards down during interviews with women researchers because compared to the male researchers, they find them less threatening. In summary, Thirty-eight percent of the female researcher respondents in the study stated that they were confronted with difficulties in conducting field work as a result of their sex and local gender norms. Only seven per cent, however, noted that they had less access to male interviewees as a result of being female. One respondent remarked that she was not taken seriously as a young female researcher in effect alluding to the fact that the age of the female researcher may also be an important factor. Overall, the survey results, in line with field research elsewhere (Barnett and Cason, 1997), confirm that gender of a researcher has a significant influence on field work research and, more importantly, the findings indicated that the influence may or may not be advantageous

A different perspective in regards to sex segregation was made by Joseph (2000). He argues that there have been noteworthy transformations on the aspect of the Middle East women's studies in the last two decades of the 20th century. In that period, he opines, there has been a progressive shift in seeing Islam as an exclusive force in shaping life options to exploring the complex role of historical and political process that could be used to understand the diversity seen in different countries in the region in regards to culture pertaining to women. An illustration of this progression in the women studies is seen in Ross (2008) paper titled *Oil, Islam, and Women* which explored the link between oil rents and the gender right. His study and arguments from the study findings has implications for the study of the Middle East, Islamic culture, and the resource curse. One of his core arguments from the findings of the study is that there is a negative relationship between the extraction of oil gas and the role of women in the work force and women's political influence in the traditional and national institutions. As such he alludes to the fact that the extraction of oil indirectly perpetuates the patriarchal system. From his study's finding, he argues that the low influence by women in mineral rich states in the Middle East (Saudi Arabia, Kuwait, Oman, Algeria, Libya), as well as in Latin America (Chile) may be because of oil and not Islam traditions as suggested by other researchers. According to him, oil indirectly reduces the women in labour force and ultimately their political influence in these countries since production of oil is linked to the undermining of other 'women' friendly sectors like agriculture. His arguments adds a new angle cast a new light on the 'resource curse' extending it from slow economic growth (Sachs and Warner 1995), authoritarian rule (Ross 2001a), civil war (Collier and Hoeffler 2004) to impacting the core social structures. Figure 7.7 shows the regression analysis which captures Ross's suggestion that oil production is statistically correlated with female labour, and female representation.

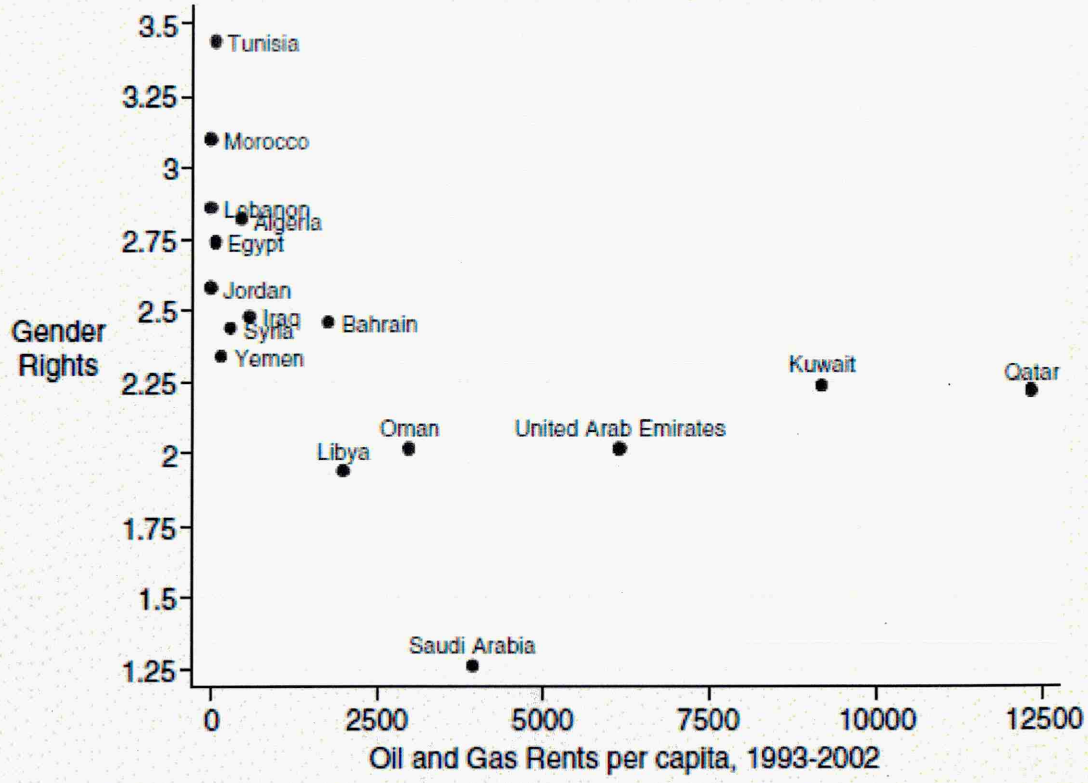


Figure 7.7: Oil Rents and the gender rights index in the Middle East

Source : Ross (2008) paper titled Oil, Islam, and Women

Al-Nasr (2009) however, found fault with Ross model of gender equality and 'Oil Rent'. She argues that the flaw in Ross model which attributes gender equality more to Oil rent than Islam is largely because Ross gap between the countries that the Ross uses as his units of analyses is due to not just oil but many other factors. In particular, he points out that the fact that Ross comparison of impact of 'Oil Rents' and Islam on gender equality is flawed since there is no standardized form of measuring the effects of multi-cultural/religious population on political culture and institutions. In addition, he asserts that Ross errored in failing to consider the vast historical and demographic tdifferences amongst the countries used in his model.

According to Al-Nasr (2009), 'Oil rents' may an opposite effect on gender equality for while she agrees that some government may have used oil revenues to stifle calls for democracy and equality they may also use 'oil rents' as drives of development and modernisation. The argument between Russo and Al-Nasr about women right in oil country provides further insight in the discussion on the preceding section which focused on the restriction or challenges faced by women researchers in Middle East and North Africa in field work research. Having grown up in an oil rich country, the reseacher, based on her expereince finds agreement with Al-Nasr argument since she believes that many girls in Libya accessed education and found employment beacause of the Oil Rents. Indeed in the case of Libya, girls in the cities had a greater chance to accessing education that their counterparts in the villages who often missed out on accessing education because of challenges like having to walk long distances from school and being subject to more restrictive customs and tradition. According to the world factbook (2010) literacy total population of famele increase rapidly and reached 72% of Female in 2013. In terms of labour force – female increase from only almost 11% in 1981 to 29% in 2013. Figure 7.8 shows labour force (female) percentage increase of total labor force in Libya in 2013.

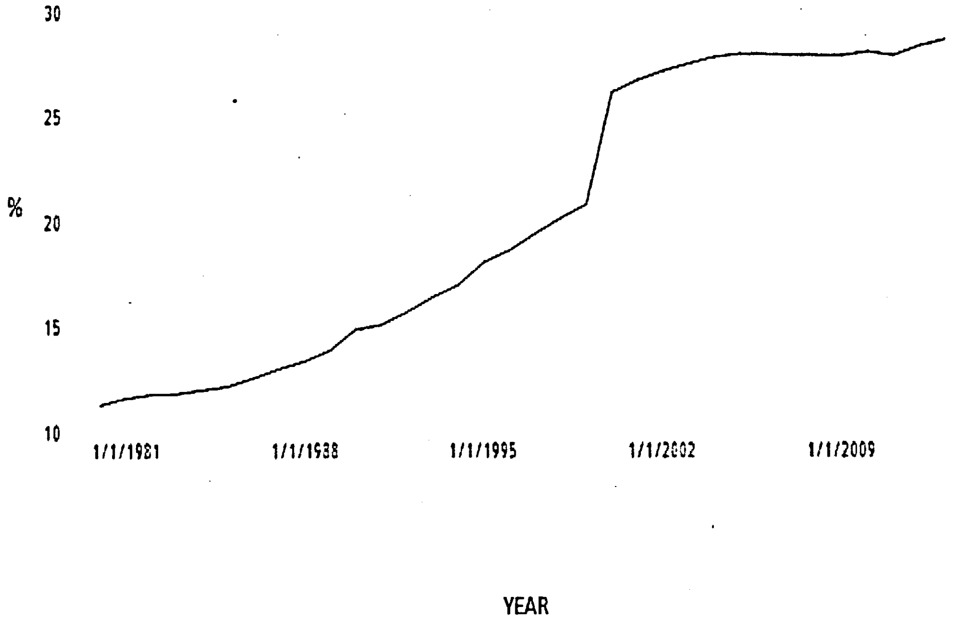
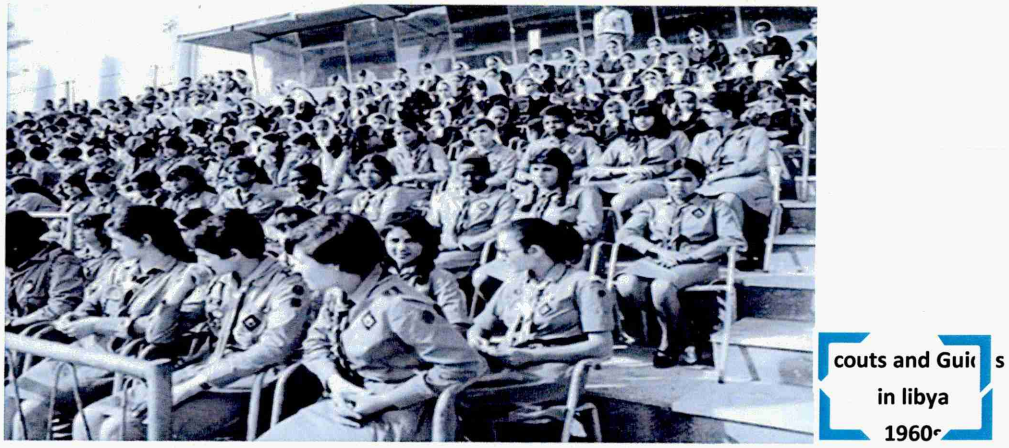


Figure 7.8: Labor force - female (% of total labor force) in Libya 2013

Source :The world bank (2013)

In Libya's case, it is the researcher's considered opinion that the obstacles faced by female researchers in field work is due to the laws of the tribe and the family which generally prohibit the mixing between men and women, but provides for exception in areas such as education, employment. These exceptions are provided for by the laws in the Arab states which are generally segregated into two categories (Maktabi, 2009) civil law and personal status or "family law" (Al-Nasr, 2009). Each of the Arab countries has its own customs and law which were formed through history and this perception of women in the Arab countries differ even among families. Although the Islamic religion defines aspects of mixing between the genders, the subject of mixing of the sexes is linked strongly to customs and traditions as well. In Libya's case as depicted in the photos below, the subject of mixing can be attributed to customs and traditions more than anything else. From the photos which were taken in the 1950s and 1960s in Libya, it shows that while Libyan women have always held prominent position in the society, the issue of mixing even among the educated has always been prohibited. This is in accordance with customs and traditions not only the teaching of Islam about no mixing between the sexes in gatherings. As can be seen from the photos, most of the girls are not wearing hijab despite the fact that Islam requires it.



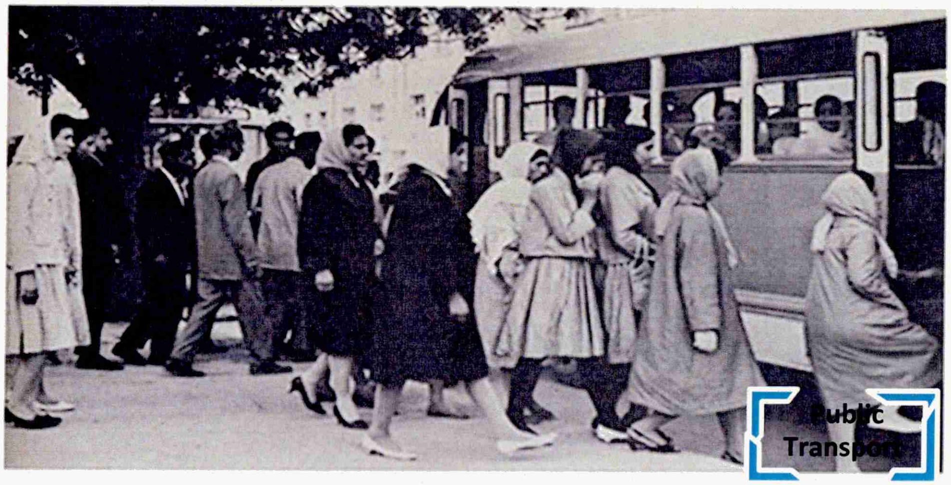


Figure 7.9 shows sex segregation (public place in Libya)

Clearly, there is no consensus on the aspect of sex segregation in the eastern societies, especially in the Arab societies. This observation find resonance with the findings of the study by Agnawe (2013) titled *An investigation into the influence of cultural dimensions on the use of the Internet by Libyan academics*. A key finding of this study is that the perception of difference in equality of males and in the eyes of the public resulted in cautious behaviour of the different sexes in the public, which in the long run translate in considerable passivity in novel environments, even those inside educational institutions. In educational institutions it was observed that the cautious behaviour is usually reciprocal in nature, involving both the female students and those interacting with them. It was noted for instance that academic environments that are guided and controlled by familial and societal rules tended to shield female students from open online interactions, if they felt that female student was under undue pressure from families and the other societal rules.

In this study, in order to try to avoid social criticism, at the same time to reduce the impact of this barrier on the data and information that will be collected, the researcher made the questionnaires as the main method in the study. To gather data from male participants, a female need to be accompanied by male relative see (figure 7.10).

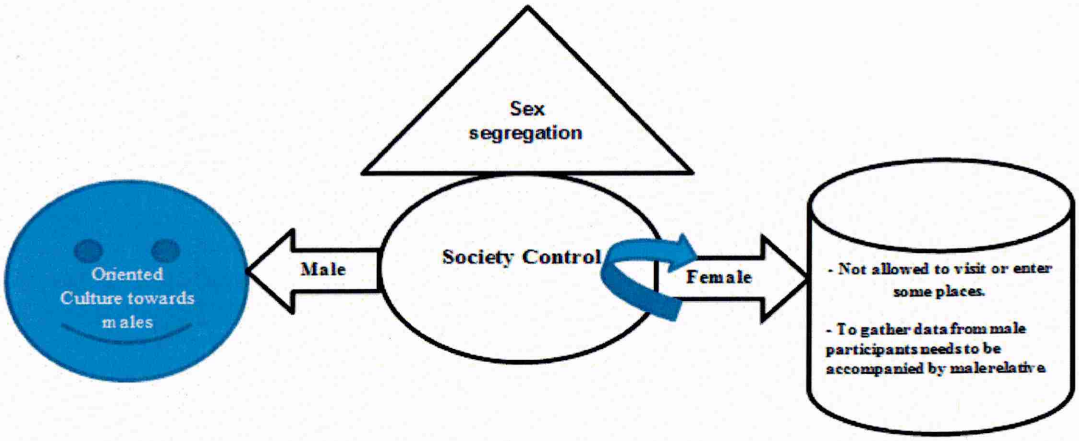

Sex segregation
Oriented Culture towards males
Male
Society Control
Female
- Not allowed to visit or enter some places.
- To gather data from male participants needs to be accompanied by malerelative

Figure 7.10: Explaining the impact of sex segregation on behaviour of female's researcher during field work.

Interviews complemented the data collected through the questionnaires. Given the sex segregation obstacles discussed above, the researcher came up with a novel approach to data collection from male research participants who were strangers to her; she asked for presence of the interviewer's brother during the interview. Clearly, the challenges faced by the women researcher's from Arab societies during the fieldwork and data collection due to customs and traditions because of sex segregation does have an impact in the type of data collection methods and requires novel approaches such as the one employed by the researcher to facilitate data collection by the researcher and to avoid social criticism.

Generally, fieldwork research phases progressed smoothly. The fieldwork was a success; the data required were acquired. This is not to say that the research is without some limitations – efforts were made to overcome them to avoid influencing research outcome. The majority of my fieldwork was conducted after the 17 of February revolution in Libya; the data was collected during September 2011 until the end of December. However, it was surprising to find that responses to the questionnaires were quite positive. A large number of fishermen were gathered at the bays and near the shores (Soush and Benghazi) which made the process of finding them and approaching them easier than expected. It was noticed that their attitudes were quite positive and optimistic following on from the 17th of February revolution which impacted the data collection process as they showed their readiness to participate in the study. Also, in relation to seeking potential participants for the interviews there were some difficulties of access to participants/places which required exploiting personal and family relationships to reach certain people and gain access to certain places.

7.11 Summary

The research was based on critical realism and adopted a mixed-method approach including questionnaire, interviews, documentary and photography techniques. While the data derived from questionnaires are mostly quantitative, documents and interviews materials form qualitative data, each following unique analytical processes but they played a complementary role in meeting the objectives of the study. The research strategy was developed as an attempt to apply Porter's Diamond Model (PDM) in the Libyan fisheries due to its enormous potential as a source of revenue, employment and food security, but one that has remained poorly developed. This means that different methods are required to understand and relate the different actors and factors involved (e.g. individual, communal, institutional, government, environment and international perspectives). Similarly, different techniques were deployed at different stages of the research process. The methods employed have been successful in revealing the experiences of the various actors involved, and suggestions on how to govern the sector and make it a useful contributor to the national economy. Moreover, both Porter's model and Shepherd's model have proven useful in designing the methodological approach for sourcing data from a complex sector.

The choice of multiple methods by itself has triangulated the study – it has not only generated sufficient and relevant data for the thesis, it has also enhanced the reliability of the results as indicated throughout the proceeding chapters. Ethical issues adhered to ensured that the research was conducted according to the university standard but also led to access and elicited wide response from the respondents. Notably, the researcher expanded and contributed to the discussions on the challenges facing women researchers in Arab States. Moreover in seeking to overcome those challenges during her field work she shaped a novel approach to overcoming these challenges thereby presenting a solution that could be embraced and refined further by women researchers in the Arab Societies.

The thesis now turns to the results and findings of the research, starting with analysing factor conditions and related industries of Porter's Diamond Model. This enables the fisheries sector to be wholly analysed, shortcomings identified and prospects strengthened, as well as presenting how this sector can be developed to complement other sources of national revenue for national development.

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Chapter eight

Factor Conditions and Related Supporting Industries

8.0 Introduction

With location advantages, abundant marine resources and a long coastline, together with access to labour and export markets, Libya has all the potentials to use fisheries as its new path for growth. However, a number of issues need to be implemented to give this sector its main competitive advantage considering the dominant role of oil in the economy. These challenges and threats to growth are analysed using Porter's diamond model of national competitive advantage, which highlights four main determinants and two assistant determinants for achieving competitiveness. The purpose of this chapter together with chapters nine and ten is to apply PDM to the fisheries sector by using evidence gathered from the field and documented records. To assess the production factors in the fisheries sector, the following question was posed: what factors affect fish production in the eastern region of Libya? Answers to this question based on the analysis of evidences gathered in the field are contained in this chapter.

The chapter is structured into two parts. The first part is concerned with the analysis of factor conditions (8.1) as one of the four determinants of the competitive advantage of Libya's fisheries sector. Factor conditions are factors of production or the inputs required by a firm to compete, which are further categorised into five: physical resources, human resources, knowledge resources, capital resources and infrastructure (section 5.2.1 has provided the full details). These factors are generic for all industries; however, the mixture of factors employed differ significantly from firm to firm (Porter, 1998:75). Therefore, in order to analyse the fisheries sector in Libya, fish production factors are grouped initially following Porter's categories, followed by the specific determinants of the fisheries sector that are not covered by PDM but which are important in attaining a certain level of competitiveness.

The second part deals with the determinant of related and supporting industries. According to Porter (1998:105), "related industries are those in which firms can coordinate or share activities in the value chain when competing, or those which involve products that are complementary". There are several industries that are related to the upstream and downstream activities of fisheries. These industries represent the cluster of the fishing industry and include among others: fish canning factories, boat factories, fishing gear and ice factories. Figure 8.1 highlights the two determinants of Porter's Diamond Model that are dealt with in this chapter.

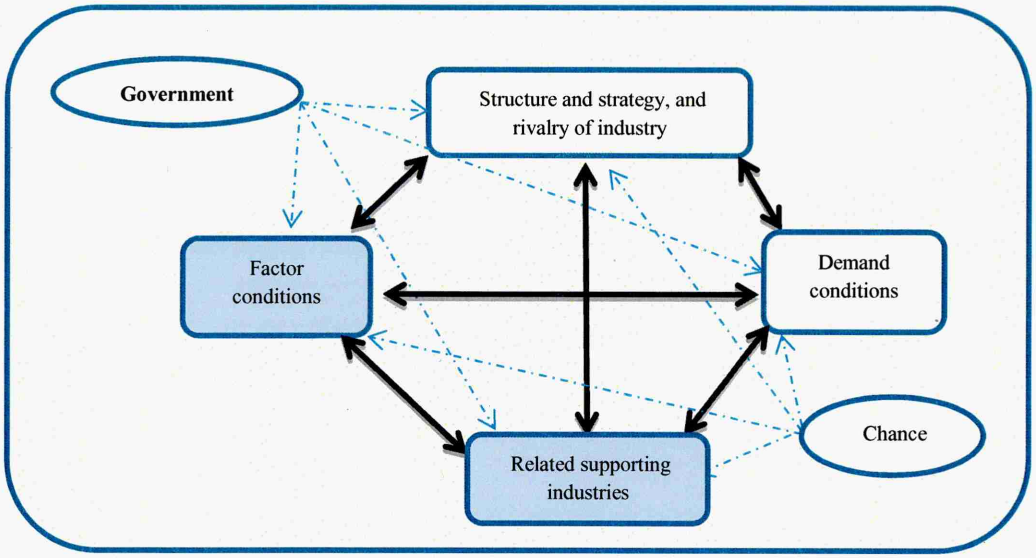
Government
Structure and strategy, and rivalry of industry
Factor conditions
Demand conditions
Chance
Related supporting industries

Figure 8.1: Focus on factor conditions and related supporting industries as part of PDM

8.1 Factor Conditions

Porter divided production factors into two: basic (endowed) factors and advanced (created) factors. These are further sub-divided by their specificity: generalised and specialised factors. The discussion in chapter five (see section 5.2.1) shows that, in light of Porter's diamond model, factor conditions do not only depend on the availability of raw materials and basic factors; meaning, the mere possession of resources does not guarantee a nation's competitive advantage. It is the advanced and specialised factors that are the most important in obtaining competitive advantage. Therefore, sustainable investment is needed in basic and generalised factors and through this process advanced and specialised factors will emerge. In a situation of resource or factor depletion or limitations, Porter suggests that competitive advantage can grow out of selective factor disadvantages because these can stimulate the innovation that would more than compensate for the original disadvantage (see chapter four, 5.1.3). In this section, production factors influencing fisheries are presented and analysed in the light of Porter's five factor conditions shown in figure 8.2 below. In addition, fish-marketing practices and the structure of markets of the eastern region of Libya are presented in section 8.2 as a part of the factor conditions analysis.

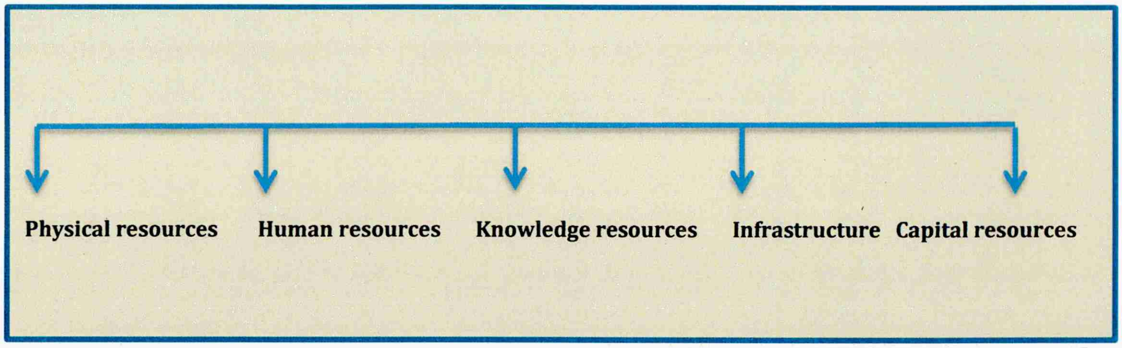

Figure 8.2: Porter's five factor conditions.

8.1.1 Physical Resources (Natural Resources)

Natural resources are simply those resources (ecological, geological, biological processes) endowed by nature, whose products satisfy human wants, with many of them essential for the survival of human beings, animals and plants, for example water and air (Bridge, 2008). Natural resources are indispensable for the functioning of modern economies, and for achieving and maintaining high standards of living in all countries. They are primary inputs in the production of all manufactured goods (WTO - World Trade Organisation, 2010), some of which require simple techniques and little investment to extract, while others require complex technology and heavy investment (Lujala, 2003). According to WTO Report (2010:1) "Natural resources are at the root of much economic activity, they are a key component of many economies, and their share in world trade is growing". Unlike classical theorist view that natural resources equals growth mentioned in section 5.1, Porter's (1998) point of view is that natural resources are inherited; however, they do not create competitive advantage. These resources, which are classified under the heading of basic factors, are often owned by the majority of countries. Porter (1998:77) also states that "basic factors remain important in extractive or agriculturally based industries". The basic factor in the context of this research is the fish resources that Libya is already endowed with by nature. The physical resources; geography and resource abundance that give Libya a competitive advantage are presented below.

A) Geographical Location

According to Porter and Yergin (2006), location is one of the outstanding assets Libya has that can boost its economic fortunes. As figure 8.3 indicates, Libya shares borders with Egypt (1,115 km) to the east, Tunisia (459 km) and Algeria (982 km) to the west and Niger (354 km), Chad (1,055) and Sudan (383 km) to the south, while to the north it is bounded by the Mediterranean Sea. Libya's coast on the Mediterranean Sea is long, estimated to be 1,970 km (Otman and Karlberg, 2007:1), stretching from the Tunisian border to Egypt. In addition, the development plan of the Libyan marine sector (2006-2010) indicated that Libya links the east of the Arab world with the west. This strategic location strengthens its proximity to the major markets in Europe; it also enhances its relation to neighbouring countries via a network of paved roads and to the outside world by air and sea links; this makes the country easily accessible, and furthermore it promotes its development. In terms of infrastructure, the ship building industry, and the steel and heavy engineering industry can develop in the coastal regions to cater for commercial fishing. The southern part of Libya is semi-desert and unproductive for agriculture; and the mountain terrain has less cultivable areas, therefore more people may switch to fishing. Thus, the location of Libya has provided the basic factor for fish exploitation for the use of the people and the growth of the economy. The implications of this location to the development of the fisheries sector are discussed in chapter eleven.

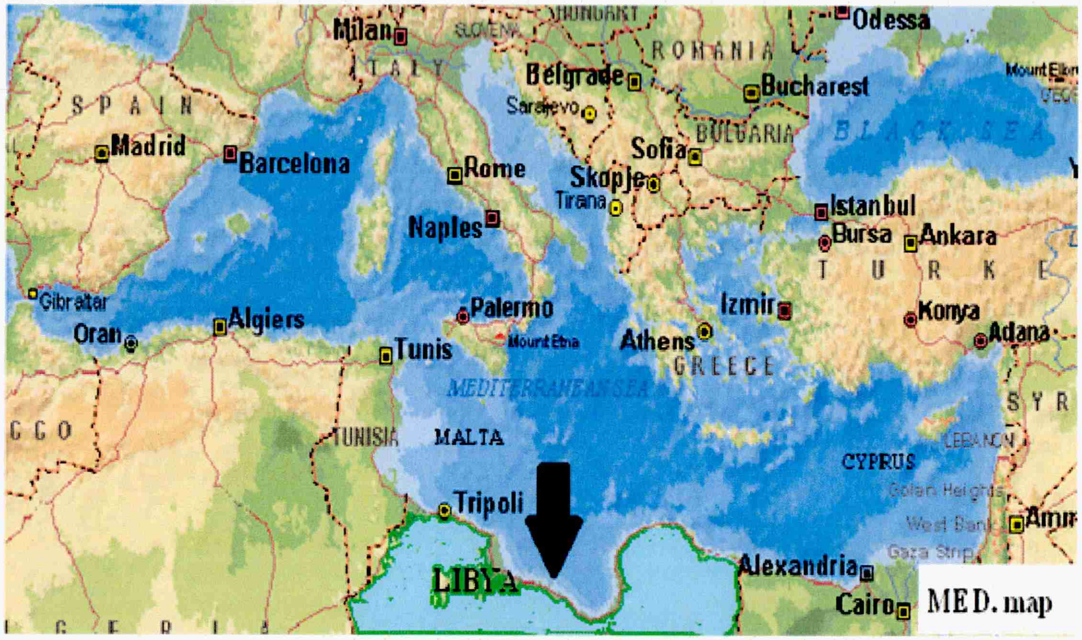
Milan
SLOVENIA
HUNGARY
Odessa
ROMANIA
ITALY
Belgrade
Bucharest
Mount Elbrus
SPAIN
Sarajevo
BULGARIA
BLACK SEA
Madrid
Barcelona
Rome
Sofia
Skopje
Tirana
Istanbul
Naples
Bursa
Ankara
TURKE
Gibraltar
Palermo
Izmir
Konya
Oran
Algiers
Tunis
Mount Etna
Athens
Adana
GREECE
MEDITERRANEAN SEA
SYR
CCO
TUNISIA
MALTA
LEBANON
CYPRUS
Golan Heights
Tripoli
West Bank
Amm
Gaza Strip
Alexandria
LIBYA
Cairo
MED.map

Figure 8.3: The geography of the Libyan location in the Mediterranean Sea basin.
Source: Mediterranean Action Plan (2005)

B) Fish Stocks

This discussion is divided into the following two sub-themes: fish stocks and degrees of contamination in the Libyan waters. Regarding fish stocks, chapter four suggests that the Libyan coast is rich in term of fish stock. For example, FAO (2011:7) states that Libya's long Mediterranean coast enjoys rich fish resources. There are no accurate available statistics on the Libyan fish stock; however, in the past an attempt was made by the French along with other foreign organisations to examine the current state of Libyan fish stocks. Their findings remain largely unknown or inaccessible (Otman and Karlberg, 2007). For the eastern part of Libya where this study was carried out, a scientific cruise was conducted in August 2003 to calculate fish stocks. The researchers, made up of the Libyan MBRC, in collaboration with a Greek research institute, pointed out that the demersal stocks in particular were healthy. Further exploration is required to ascertain the stock for commercial exploitation. The findings of this study showed that there are no updates or recent studies about the ecological aspects of marine fisheries which estimate the fish stock; therefore insufficient data exist about the fish stock, and there is a lack of detailed mapping to determine fishing areas in territorial waters.

Records obtained from Libyan authorities are highly aggregated and do not provide useful information about the country's fishery and its status that can be used for research, policy or investment. For instance, FAO1 states that since 1996, there have been no studies to assess fish stocks. In addition, one of the experts at the Marine Research Centre (EMC) strongly criticises the lack of up-to-date data:

> For several years, the sound planning and management of fisheries has been hampered by major information constraints: the absence of a regular data collection system on catch and effort, the absence of a reliable fishery monitoring system and inappropriate scientific knowledge on the status of the stocks.

In support of the above statement, the development plan of the Libyan marine sector (2006-2010) indicated that there is no updated information on fish stocks in the Libyan waters (National Foundation for Maritime Investment, 2005:11-12). The last surveys for the eastern coast of Libya were conducted in 2003 and the period during which they were conducted was very short. The report alleged it was for only five days duration; an insufficient length of time in which to estimate the fish stock. There is a great imbalance: plans are set by policy makers concerning the regulation of exploiting fisheries without information or data on the size of the fish stocks. Indeed, fishery activities are entirely dependent on the state of fish stocks.

The research also investigates government reports and the views of respondents on the issue dealing with assessment of fish stocks. For example, National Foundation for Maritime Investment ' development plan' (2006-2010) stated that the adopted five-year plan for the development of marine resources cautions that for fish stocks to be exploited optimally without biologically or environmentally affecting the fish stocks, catch should range between 75 and 100 thousand tonnes of various types of fish (benthic and superficial). The above estimated was supported with the preliminary results of previous studies and comparative estimates of fish stocks for countries that bordered the Mediterranean. From the above responses and estimates, it appears that even though Libyan rich fish resources are abundant, the actual estimate of the number of stocks and specie types are not known. Given this current state, substantial investment in data acquisition is required to bring out the great potential of the sector in a manner that would encourage private sector investment. Further recommendation was made by FAO1:

> Scientific studies should be carried out to determine fish stocks so that a plan can be developed to commensurate with the scientific results of the study for the purpose of proper and sustainable investment.

Regarding the natural environment and the degree of contamination of the Libyan coast, Hart (1995:987) observed that: “the theory of competitive advantage based upon the firm’s relationship to the natural environment is composed of three interconnected strategies: pollution prevention, product stewardship and sustainable development”. According to FAO (1995:6), marine pollution means: "the introduction by man, directly or indirectly, of substances or energy into the marine environment [...] resulting in such deleterious effects as harm to living resources, hazards to human health, and hindrance to marine activities including fishing, impairment of quality for use of sea water and reduction of amenities”. Marine pollution deteriorates water quality and reduces fish stock. According to World Wildlife Fund (WWF) (2003), up to 80 per cent of marine pollution comes from land-based activities. A literature survey on pollution rates indicates that there is limited information on pollution; the most recent evidence about pollution on the eastern region coast of Libya was published in 2008. Al arifi (2008) divided the sources of pollution on the coastline of the eastern region of Libya into three:

1- Pollution by oil, through shipping operations, discharge of oil at sea by ships and oil tankers, the dumping of oil remnants in tankers into the sea, waste oils from ship incidents experienced by oil tankers and merchant ships (Table 8.1)

Table 8.1: Rates of pollution in the sea due to oil

Operations when shipping oil	Incidents of ships	Extracting oil	Oil pipelines	Refineries	A variety of activities
49.5%	20.6%	5.1%	0.4%	11.9%	18%

Source: Al arifi (2008:273)

2- Pollution by sewage - that is, water used in homes and washing plants, workshops and industrial plants, without treatment are sources of environmental pollution. The entry of sewage into the marine environment damages the following. First is the consumption of dissolved oxygen into sea water, where marine organisms need to have a certain percentage of the oxygen gas dissolved in water (Al arifi, 2008:278). Second, pollution by sewage damages fishing boat; some worms and parasites will grow as a result of sewage leakage into wooden boats; this leads them to eat panels and causes the rapid onset of defects in the wooden boats.

3- Pollution by chemicals and pesticides used in agriculture - pesticides used to combat agricultural pests are composed of several toxic compounds normally used in spraying and this mixes with air and then falls onto the water; pesticide residue also travels through the soil drifting across the valleys after rain.

Any of the above pollution source leads to rapid death in fish, especially fingerlings; human health will also be affected after eating the products of the (polluted) sea. Pollution by oil residues, factories, buildings and untreated sewage is the main cause of the rise in the rate of a concentration of trace elements and heavy metals; this is damaging to the marine environment, especially near beaches (Al arifi, 2008:268-279). Figure 8.4 shows the types of pollution which were explained in the previous section, in the ports that were studied in the current research.

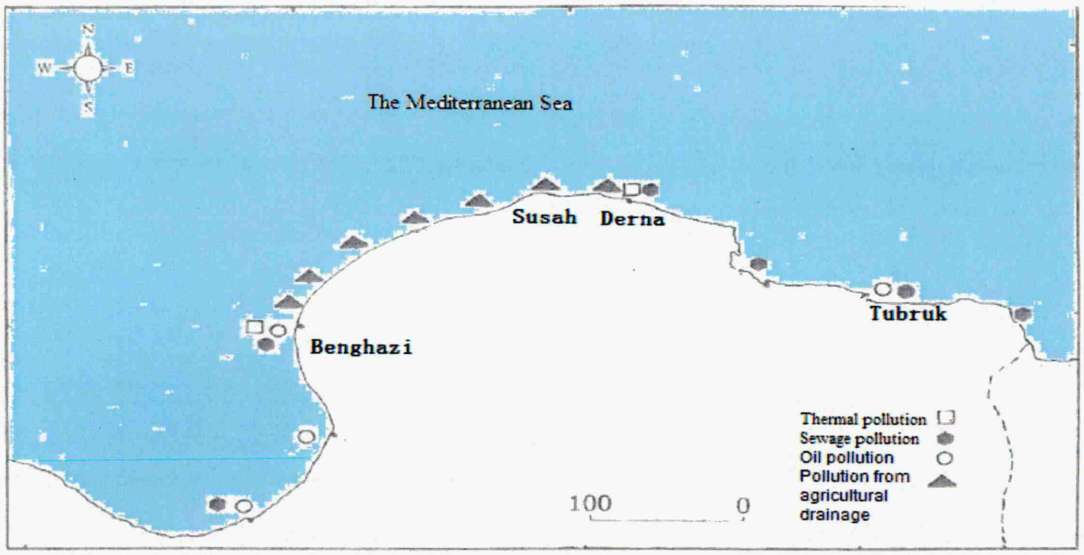
N
W
E
S
The Mediterranean Sea
Susah
Derna
Tubruk
Benghazi
Thermal pollution □
Sewage pollution ●
Oil pollution ○
Pollution from agricultural drainage ▲
100
0

Figure 8.4: Sources of pollution on the coast of the eastern region of Libya (study area).
Source: Adapted from Al arifi (2008: 272).

A number of concerns were expressed from the perceived pollution of the Libyan coast. For instance, FAO1 pointed out that:

> There is pollution especially in the coastal towns due to untreated sewage which pours directly into the sea causing bacterial pollution. The results of the studies carried out by the Centre of Marine Biology also document the presence of oil pollution along the Libyan coast on both sandy and rocky types of beaches because of the ballast water from oil ships.

He added that:

> Scientific studies related to fish stock and pollution will contribute to the advancement of the fisheries sector, which will be effective in its contribution to food security in Libya.

In addition, the report of the General Authority for Marine Wealth (2009) displays some aspects of pollution in the Libyan ports, one of which was throwing plastic water bottles and plastic bags in the sea which damages sea environment (see Figure 8.5).

A

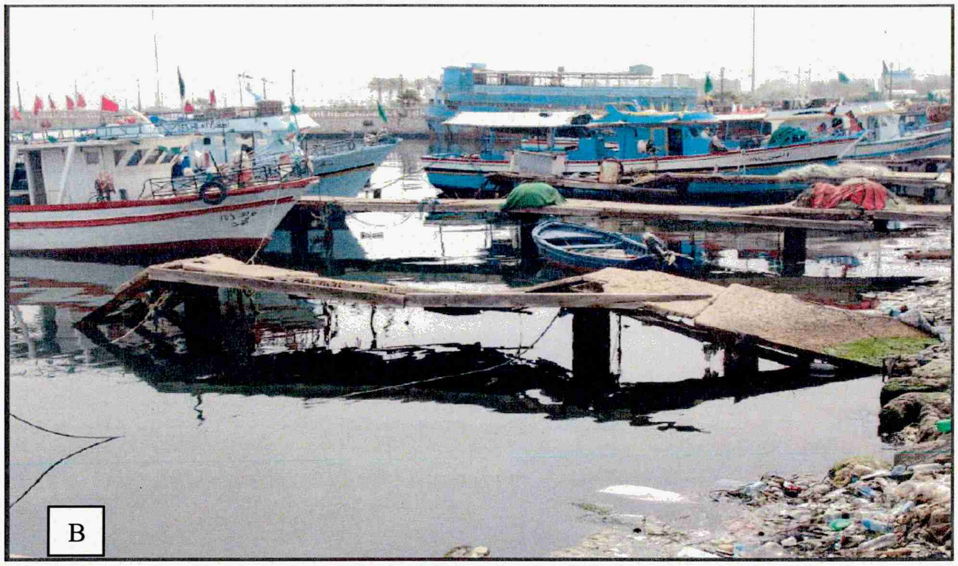

Figure 8.5 (A, B): Images showing pollution in the Libyan Sea due to plastic water bottles and bags.
Source: General Authority for Marine Wealth (2009).

However, other participants believed that the degree of contamination of the Libyan coast is very low, for example, WS1 noted:

> The Libyan fish produced on the Libyan shores is of high quality and it is free from contaminants.

In addition, GR1 states that:

> The Libyan beach is one of the beaches less affected by environmental contamination of fish.

These responses indicate an understanding of the effect of pollution on the marine environment, particularly on the health of the fish catch. Concerns have been raised by fishermen, as well as vendors of fish, about the sea environment and the level of pollution. As substantial investments in infrastructure and processing facilities are made in the fisheries sector, these are the issues to control so that the catch meets the minimum standard for both the domestic and the international market. It is recommended that Libya needs to work together with countries in the region to protect the Mediterranean Sea from increased pollution levels. For example, FR1's thoughts are:

> Libya should work with and focus on international campaigns to protect the Mediterranean Sea from chemical pollutants, especially the northern prong of the Mediterranean, where the rate of pollution is high due to European factory waste.

Recently the Libyan government in collaboration with FAO have taken positive steps to resolve the issue of the assessment of fish stocks and coastal area pollution. The FAO (2009) was to provide technical assistance in the areas of sustainable water resource management, fish stock assessment and coastal area pollution. About 18 projects, totalling US$71 million was budgeted on the implementation, monitoring, coordination and evaluation of the programme, starting from 2010. With the onset of the Libyan revolution and the incessant unrest prevailing in the country, the status of this project can only be speculated on, as those in charge of this project are difficult to reach.

The findings that came out of the results can be summarised thus: there are no recent studies of the fish stock, which hinders the proper planning and development of the fisheries sector. This theme featured in the responses of the FAO1 and EMC. Similarly, although there is pollution on the east coast of Libya according to a study by Al arifi (2008), the responses made by FAO1, WS1 and GR1, about pollution on the Libyan coast is, however, exaggerated. Inconsistency can be observed; it might be that the new programme between the Libyan government and FAO, starting in 2010 will solve this issue. The project has not been delivered due to prevailing security challenges.

7.1.2 Infrastructure of Ports

According to FAO (2010:11), "the role of the fishing port may be considered as the interface between the harvesting of a fish and its consumption; thus the type and size of fisheries port and its infrastructure greatly influence the way in which, and rate at which, a country's living marine resources can be exploited. The perceived need for a fishing port, however, is likely to originate from a combination of fisheries management planning and pressure from the industry to meet local consumption needs and of the export market". Also FAO (2010) indicate that to design a fishing port several important points must be realised; a port and its facilities must be sized to understand the size and type of fish stocks to be exploited; access to and advice regarding the latest and most accurate biological statistical data and fisheries management forecasts must be available and ascertained. Unfortunately, this information is not readily available in Libya. Fishing boat performance, size and composition must be taken into account as the development plans of fisheries management also depend on this. Types of fishing ports also need to be considered. There are different types of fishery operations, each requiring systematic arrangements depending on the scale and type of catch. Due to the complexity of fishing operations, it is also problematic to arrive at clear-cut definitions that fully and consistently characterise port infrastructure. If one considers the type of fisheries and scale of operation, port infrastructure can be defined to serve as an artisanal, coastal, offshore or distant waters port (FAO, 2010).

In Libya, some studies and field surveys have been conducted to collect data and information about landing sites (fishing port) and the components of the fisheries sector. The most important survey was conducted by the Marine Biology Research Centre with the cooperation of the FAO. The 1993 project, named LIBFISH, received technical assistance from the Libyan Marine Fisheries Centre. Collaboration between the Marine Biology Research Centre and the Regional Project for Artisanal Fishing Western Mediterranean COPEMED conducted a survey in 2000. The most recent of these surveys was conducted from 2005 to 2007 by the Marine Biology Research Centre in Tajura. This survey explored the potential and the facilities of existing fishing ports to collect data and information about landing sites (fishing port) and the components of the fisheries sector in Libya. This research focuses only on the eastern region's harbours. Table 8.2 shows in detail facilities available in sampled fishing harbours and ports examined in this research. Poor infrastructure and the absence of many facilities in the fishing harbours under study are clear from Table 8.2. Many essential facilities and services for boats are missing from most of the fishing harbours; for example, engine maintenance facilities, adequate services for boats and the maintenance of fishing gear etc. This is a hindrance to the development of fisheries in Libya in general and in the eastern region in particular, because infrastructure is the backbone of most economic activities. The fishery infrastructure in the study area is weak and this is one of the major barriers that limit Libya benefiting from the fisheries sector.

Table 8.2: Infrastructure of Fishing Harbours in the Sample Study

Landing site	Fishing port of Benghazi	Port of Susah	Port of Derna	Port of Tobruk
Permanent	√	√	√	√
Seasonal	-	-	-	-
Model Site	harbour	harbour	harbour	harbour
Type of Boat	Flouka + Motor+ Jarafat.	Flouka + Motor		Flouka + Motor
Storage Units	Available	*Not Available*	*Not Available*	*Not Available*
Syndicate	Available	Available	Available	Available
Cooperative Societies	Available	Available	Available	Available
Training Centre	*Not Available*	*Not Available*	*Not Available*	Available
Office of Fishing	Available	*Not Available*	*Not Available*	Available
Facilities and Services for Boats	*Not Available*	*Not Available*	*Not Available*	Available
Engine Maintenance	*Not Available*	*Not Available*	*Not Available*	Available
Selling Engine Parts Cooling	*Not Available*	*Not Available*	*Not Available*	*Not Available*
Maintenance of Fishing Gear	*Not Available*	*Not Available*	*Not Available*	*Not Available*
Places to Provide Fishing Gear	*Not Available*	*Not Available*	*Not Available*	*Not Available*
Shops for the Sale of Food	Available	*Not Available*	*Not Available*	*Not Available*
Cafes and Restaurants	Available	*Not Available*	*Not Available*	*Not Available*
fuel	Available	*Not Available*	*Not Available*	*Not Available*
Fresh Water Supply	Available	Available	*Not Available*	*Not Available*
Supply of Electricity	Available	*Not Available*	Available	*Not Available*
Refilling the Ice	Available	*Not Available*	Available	*Not Available*
Ice on the Boat	Available	Available	Available	*Not Available*
Boxes to Keep the Fish	*Not Available*	*Not Available*	*Not Available*	*Not Available*
Fish Handling Place	*Not Available*	*Not Available*	*Not Available*	*Not Available*
Ice Stores	Available	*Not Available*	*Not Available*	*Not Available*
Place for Cooled Fish	Available	*Not Available*	*Not Available*	*Not Available*
Drainage Facilities	*Not Available*	*Not Available*	*Not Available*	*Not Available*
Place for the Sale of Fish	Available	*Not Available*	Available	*Not Available*

Source: Salem, Al Zgozi (2007)

The poor infrastructure is confirmed by interviewees. For example, FM1- summarised the poor state of fishing infrastructure:

> The infrastructure of fishing harbours is very poor in the eastern region such as the maritime port of Sousse. The maintenance is non-technical and these technical errors impact on the ability of some types of big boats to anchor in the harbour. Furthermore, there is a lack of maintenance workshops for boats and there are no special cranes to raise boats. There are not any special services places for fishermen and there is no security centre, no petrol station and no drinking-water tanks.

Lack of good infrastructure applies to most of the eastern coast ports. In addition, FAO1 confirmed that the:

> Lack of good harbours along the Libyan coast and on the landing zones in Libya constitutes a problem; the facilities are not properly equipped and they are disorganised.

GR1 also noted the lack of basic infrastructure for fishing; in other words, there are no places for boats along the coast:

> If we examine the eastern region from Pardy to the port of Benghazi, no real fishing port exists. Some ports have just started working. This is the only obstacle facing fishermen; it means that there is no infrastructure. There was no programme for large companies to come and enter the ports, start working hard and get on with production. I am sure that, when nine of these ports are completed, besides the other three ports whose contracts have been signed, almost 12 ports will double their production to more than 40,000 tonnes, which is a good figure. The annual production of fish should not be less than 100,000 tons per year. Any catch above 100,000 tons will certainly result in a boom in the entire region and not only the market in Libya.

The types of boats in the study are very important for both infrastructure design as well as production quantities of fish and fish species caught. In the eastern region of Libya, three types of boats are used: the Flouka, the Motor and the Jarafat (see Figure 8.6). The distribution of the number of fishermen working on the boats shows that their numbers vary depending on the type of boat employed. The results obtained from the field work has shown that there are 1-3 fishermen on each small Flouka boat, while the larger engine powered motor boat has 3-7 and the Jarafat, which appears the largest contains 9-16.

It was found that boat type has a significant impact on fish production capacity. Other factors influencing this include the number of fishermen and the experience of fishermen on board the boat. All these factors have an effect on the quantity of fish caught and whether this effect is statistically significant or not can be seen in the following paragraph.

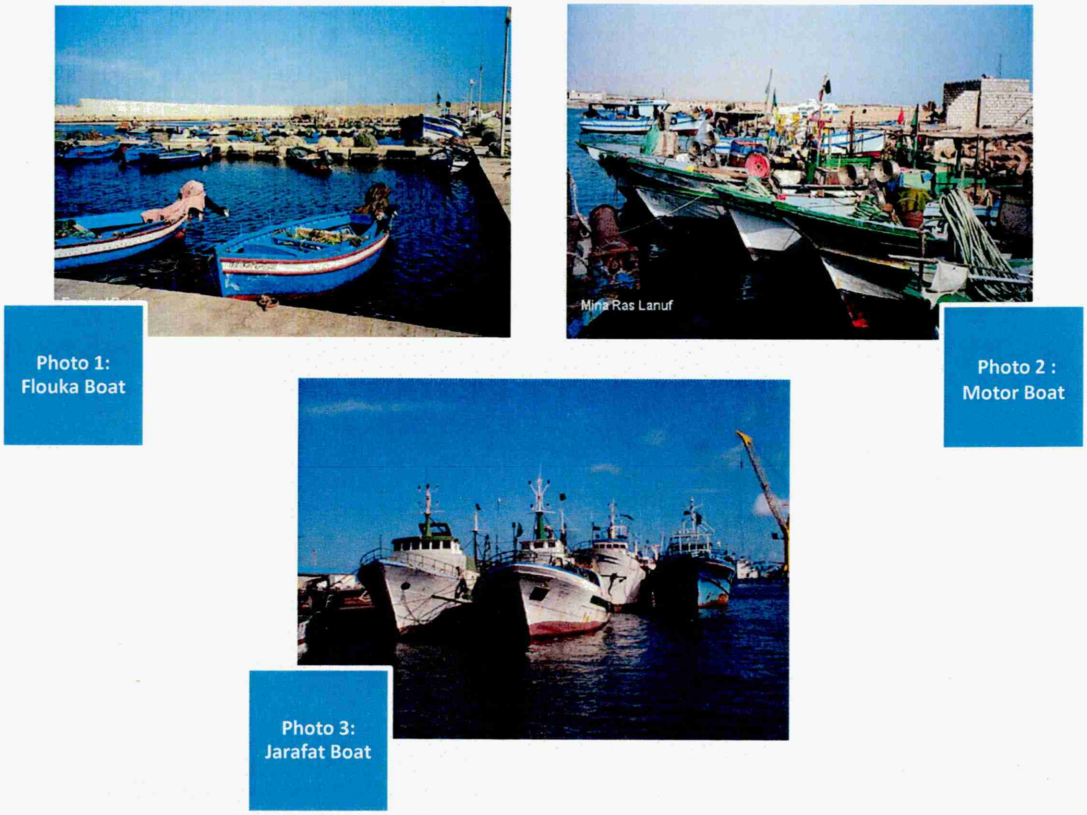

Photo 1: Flouka Boat

Photo 2 : Motor Boat

Photo 3: Jarafat Boat

Figure 8.6: Types of boats used for fishing in the eastern region of Libya.
Source: Marine Biology Research Centre, Tajoura - Tripoli, 2013.

There is a relationship between the type of fishing boat used and the total annual fish production. It shows from Table 8.4 below that the result of the Chi-square test indicated that on the whole, the relationship between the type of fishing boat and the total annual production quantity can be considered as the strongest compared with the other variables in the test. Test of significance showed that *P*= .0001 and Cramer's V= 0.501 suggesting a moderate association between the types of artisanal fishing boats and fish quantity; statistically, it is significant. (see Appendix J Table one (a - d) and Table two (a - d) for the chi square results of type of fishing boat and number of fishermen).In addition, Table 8.3 illustrates the test of significance result and shows that while *p*=0001, Cramer's V= 0.335, suggesting an association between the number of the fishermen and fish quantity that is statistically significant. In summary, the Chi square test was used to examine these factors in relation to fish quantity. The results confirmed that there is a statistically significant correlation between fish quantity and type of boat and number of fishermen working on the boat. This simply means that where there is enhanced fishing equipment with the right (trained) personnel, fish catch most likely increases.

Table 8.3: Factors Influencing Fish Quantity in the Eastern Region of Libya

Dependent Variable	Independent Variables	Relationship between Dependent Variables and Independent Variables	
		Chi-Square	**Cramer's V**
Total Annual Production Quantity (tons)	Type of Fishing Boat	$p = .0001$	0.501
	Number of Fishermen	$p = .0001$	0.335

8.1.3 Capital Resources and Investment in Fish Wealth

Fish quantity is affected by the level of investment. Capital invested in any industry is of great importance in the support and development of the industry. However, according to the 2006-2010 development plan of the Libyan marine sector, the investments allocated to the activity of marine wealth in general was not appropriate to the potential of this activity and what it can contribute to development and food security (National Foundation for Maritime Investment, 2005: 3-4). In 1972-2005, it constituted only 0.55% of the total budget allocation plans for Libyan economic and social development (National Foundation for Maritime Investment). Figure 8.7 shows that spending on the marine resources sector was weak and sometimes non-existent in the first and second decade after the discovery of oil. As detailed account of Libya's development plans shows in section 3.1, it can be noted that there is absence of full allocations to the marine resources sector in some years, which indicates that this sector did not receive serious government attention.

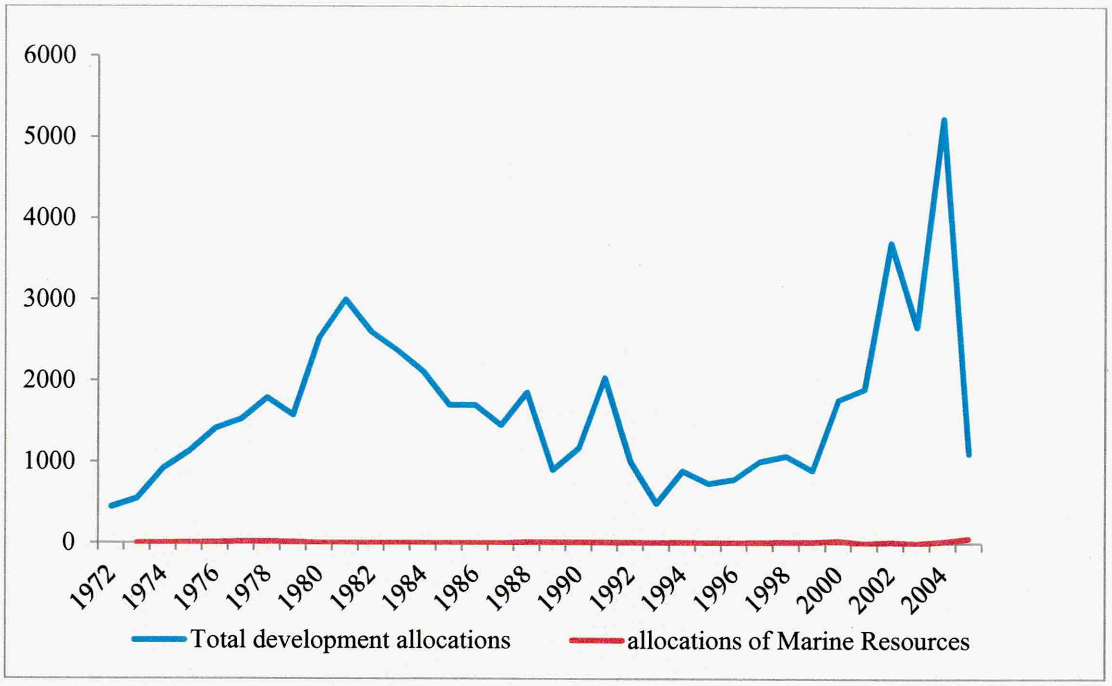

Figure 8.7: Allocations of fishery sector in development plans 1972-2005.
Source: National Foundation for Maritime Investment (2005).

As earlier documented and indicated in the above chart, there is inadequate funding to marine resource activity. From 1970 to 2005, the allocations to the development plan of the Libyan marine sector did not exceed 312.55 million LYD (National Foundation for Maritime Investment, 2005:3). In addition, there is no confirmation that this amount was actually given because the government often did not meet its obligation of releasing 100 per cent of the allocation, but ended up allocating sometimes less than half of the budgeted amount.

Funding for the improvement of the fisheries sector comes through loans provided by different agencies: the Production Transformation Fund, the Development Bank, the Agricultural Bank and the Rural Bank. Figure 8.8 shows the proportion of loans available from different sources. The value of the total loans granted from 2005 to 2008 was LYD 112,957,662. Out of which LYD 15,533,462 came from the Production Transformation Fund; LYD 13,095,000 from the Development Bank; LYD 83,717,000 from the Agricultural Bank; and LYD 612,200 from the Rural Bank, respectively. Further, the number of loans granted during the four years 2005-2008 did not exceed LYD 1,455,000 whether from an entity such as a company or factory or from individuals (General Authority for Marine Wealth, 2009). The purposes of these loans were multiple: to buy boats, fishing vessels and gear, to establish fish farms, and fishing-gear, and fish-canning and ice factories.

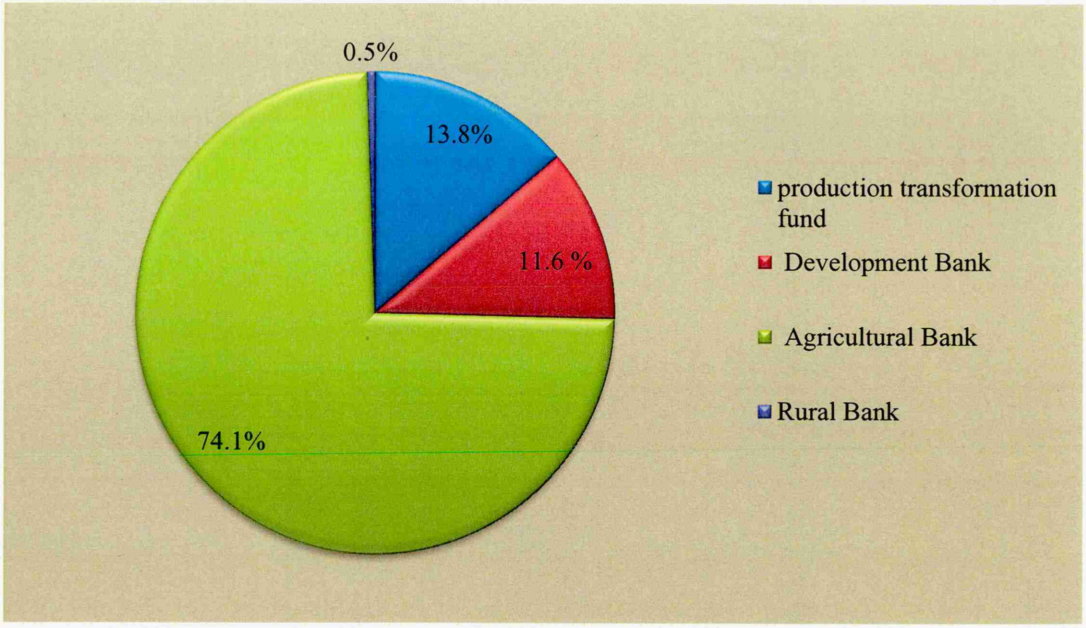

Figure 8.8: The ratios of loans until the end of 2008.
Source: General Authority for Marine Wealth (2009).

Financial funding and support for fishermen are essential to stimulate investment and development since fishing is still in the early stages of innovation and sophistication. It faces many challenges in the production process as well as in the marketing of products. For example, Libya has a soft loan system offered to individuals at a great concessionary term, such as interest holiday or no interest at all, long repayment period and little or no management charges. The loans are usually disbursed by government agencies through Specialised Credit Institutions. However, analysis of the findings based on responses provided in the questionnaire administered to fishermen in the eastern region of Libya shows that 47.7 per cent of respondents (53 subjects out of 110) reported that loans are not available or are inaccessible, while 36 per cent of respondents (40 subjects) were not aware that the state offers loans to fishermen (Figure 8.9). This might be due to nepotism and favouritism, which has been widespread and characterised the manner in which resources were allocated to individuals by the previous Libyan government. Another 15.3 per cent (17 subjects) of respondents identified high interest rate from the commercial banks as a hindrance to local investment in fisheries and fishing, thus the ability of the fisherman to borrow is limited. Out of the111 cases, (n-1) of the fishermen provided no response.

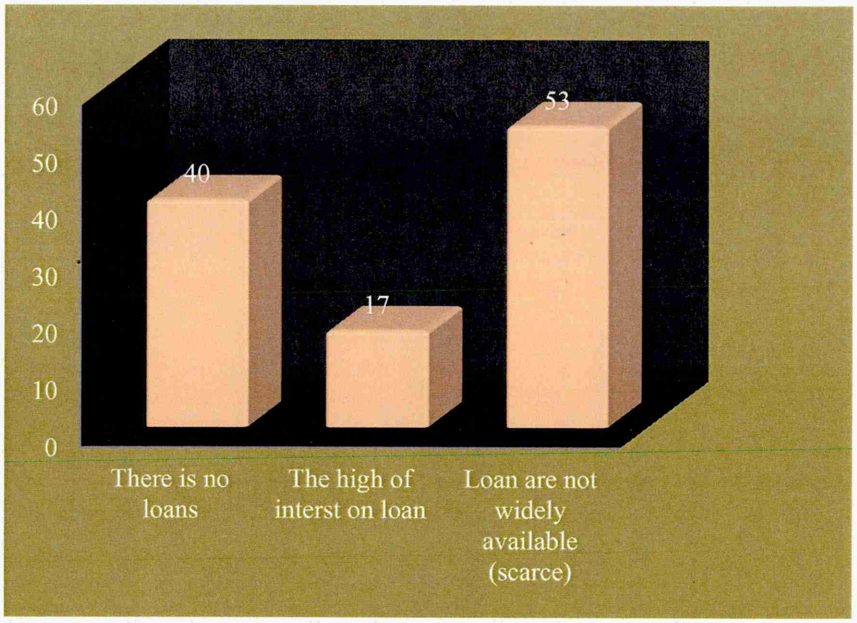

Figure 8.9: The availability of loans for fishermen.

A valid observation was made by FM1, when he opined that in the event of getting a loan, it will still be insufficient for fishermen if:

> The value of the loan does not match the costs of boats and fishing gear, especially after the closure of the fishing company that was helping us and when the fisherman had to cover the rest of the cost of the purchase with his own money.

FM2 has been fishing for more than two decades, but he is a typical example of one of those fishermen who could not obtain a loan:

> We buy the inputs of fishing from people and there is no help from the state. The price is not appropriate because those individuals have to raise the sale price of the boats and necessary supplies, and at the same time, there is no insurance on boats. The insurance is only available if the fisherman has a loan granted by the state.

Results from the questionnaire survey also support the above fishermen's views on this matter. The result in figure 8.10 shows how limited funds restrict the ability to acquire and maintain fishing equipment. The data shows that out of the 111 cases (n-4) of fishermen that responded, 27 per cent (30 subjects out of 107) of the fishermen believe that the prices of boats are too high for them. The results of the field study show that: first the high price of boats represented the greatest difficulty faced by the fishermen, who indicated that they sometimes buy used boats due to the higher cost new boats. Second is the problem of lack of spare parts, stated by 29 per cent (32 subjects out of 107). Third, nine per cent (10 subjects out of 107) of the respondents believe that it is difficult for them to periodically provide maintenance for their boats. Fourth, 31.5 per cent (35 subjects) of the respondents said they face all of the above problems. In short, the challenge of funding affects fishermen's work as a result of their inability to acquire modern fishing tools.

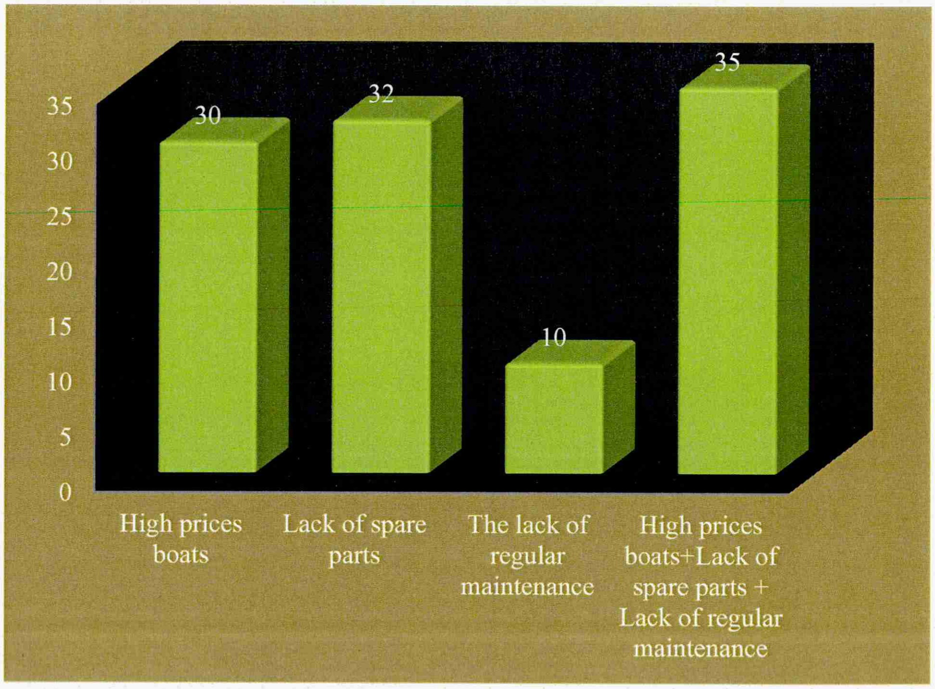

Figure 8.10: Problems related to fishing boats.

The findings displayed in figure 8.10 shows that the state has failed to realise its plan to create a successful investment environment for marine fisheries. It is unable to compete with other sectors through attracting local and foreign investment to exploit the marine sector and this has occurred for many reasons. For example, the development plan of the Libyan marine sector (2006-2010) (National Foundation for Maritime Investment, 2005:31) states that:

> The problems and difficulties faced by the activity of marine resources are caused by a lack of active policies to encourage national activity and foreign investment.

FAO1 suggested how to encourage investment for growth despite oil wealth:

> Investment law should be amended to support investment and finance.

The profitability of the fishing business in eastern Libya was also examined. The data collected shown in Figure 8.11 suggests that a small percentage of fishermen, not exceeding 3.6 per cent (4 subjects out of 110) reported that this profession is not profitable at all, while 24.3 per cent (27 subjects) state that they mostly make profit.

Fishermen who reported that they sometimes profit and sometimes have losses numbered 71.2 per cent (79 subjects out of 110). Out of the111 cases, n-1 of fishermen provided no response. This finding corroborates the thought that this sector can contribute to employment and income generation if the government succeeds in providing sufficient support for fishermen and heavily invests in the whole sector. This would provide the main support for competitive advantage.

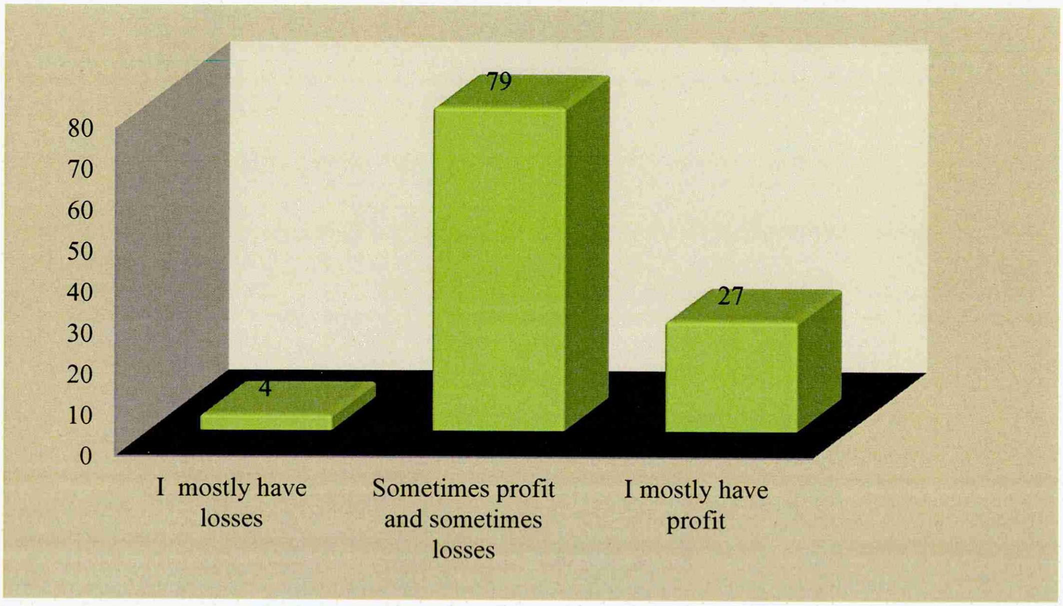

Figure 8.11: The profitability of fishing as an occupation.

Regarding foreign investment, important elements that would attract foreign direct investment include macroeconomic stability; a physical, financial and technological infrastructure; openness to international trade; non-discrimination; and transparency of the political and regulatory environment (Alfadel et al., 2013; Farias and Shalluf, 2007). The Libyan government has tried to regulate aspects of the financing of development projects from external sources for a number of reasons: to avoid spending oil revenue and to stimulate the national economy by contributing to the improvement of the productive capacity of the national economy; to improve the ability of projects to take advantage of local raw materials and contribute to the development of national products; and to help them to enter global markets. The average percentage share of FDI to Libya during the period 1980-1985 stood at US$ 408 million; this represents 29 per cent of the total FDI flows to countries in North Africa. However, Libya did not succeed in continuing to attract FDI during its period of accelerated growth and globalisation.

During the period 2000-2006, Libya's share fell to 5.52 per cent of the total FDI flows of countries in North Africa (Farias and Shalluf, 2007).

The reduction in FDI occurred for many reasons: lack of awareness among most citizens about the role foreign investment plays in the process of economic and social development of the state; citizens often believe that foreign investment is the only winner; the low level of national manpower skills compared to the level needed by foreign investment; administrative bureaucracy and a multiplicity of competent authorities; a low level of performance in general, and administrative performance in particular. In addition to the low level of infrastructure and a lack of accurate, well documented and clear information that would help foreign investors in their investment decision making, there is also a lack of scientific research on the needs of the local market - instead, there is reliance on guesswork and individual opinions (Farias and Shalluf, 2007).

The findings of this study show that in the light of the level of services and existing infrastructure, the promotion of investment in marine resource activity may not be feasible. It might lead to negative impacts that are difficult to address in the future. This might be the reason for the failure of the 2006-2010 government plans to achieve its objectives; the most important of which was to promote and encourage investment in the area of marine wealth and to attract foreign investors to benefit from the transfer of technology. Furthermore, GR1 (2011) upholds that:

> Investment in marine wealth is still considered weak compared to other counties in the region. The attention and focus is on taking advantage of the wealth of fish that has begun to attract notice in Libya recently. Consequently, domestic investment has evolved and increased dramatically. Foreign investment is still very limited in this area. Furthermore, legislation, laws and regulations with regard to fisheries and fishing as well as marketing and distribution of fish and fish products can be considered as the second pillar of the success of investment in the fisheries sector. They help build a strong fish industry.

However, there are also positive signs that emerged just before the 2011 Libyan revolution. This optimism for a better funded and well regulated fisheries sector operating with the ambit of international marine standards was expressed by GR1:

> Now, there are committees of the Union Organization from Alonfosmk tasked with examining fishing methods and determining to what extent Libya conforms to them. I think that the last report revealed that Libya applies global sea fishing conditions and that it is not a rogue with respect to fishing.

Another important barrier which prevents many investment projects from finishing their work is institutional instability; for example, EMC noted:

> During the last 15 years, the sector has been characterised by high institutional instability which delayed the implementation of most developments plans.

The discussion was structured around investment in the fisheries sector in Libya in general and the eastern region of Libya in particular. This showed that certain constraints that hinder government investment are multiple and interrelated, and this was confirmed by 1) the interview responses of FAO1, GR1, FM1, FM2, FR1, EMC; 2) the development plan of the Libyan marine sector (2006-2010) (National Foundation for Maritime Investment, 2005); and 3) a survey of fishermen. First of all, allocations to the fisheries sector are low and are not commensurate with fishery potential to contribute to economic and social development. Secondly, the granting of loans to fishermen is very limited; it also constitutes an obstacle to the development, improvement and growth of small-scale fisheries, which is part of local investment that ensures a steady supply of fish. At the same time, it is difficult to secure loans and it turns out that some fishermen are not even aware of the existence of loans. This might be due to the mediation, nepotism and lack of transparency of the state. Thirdly, the state did not provide suitable conditions to activate policies that enhance investment, whether local or foreign. Fourthly, the legislation in force in the fishing industry is not commensurate with investment promotion and development. This is considered a barrier to providing the right environment for investment as there are no guarantees to convince investors that their rights are protected. Fifthly, as regards foreign investment and engagement in international trade, this is the cornerstone of development and essential for increasing profits for the fishery sector. The absence of an adequate infrastructure and suitable legislation, as well as a lack of institutional stability, remains a barrier. In as much as these barriers still exist, the tendency to make the fisheries sector competitive based on Porter's suggestions remains elusive.

7.1.4 Human Resources

Human resources were analysed in terms of the following factors: the number and employment opportunities of the fishermen, their level of education, their skills and experience and their satisfaction with fishing as a career.

A) Number of Employment of Fishermen

According to the General Planning Council (2003), the human factor was a constant obstacle to the increase in fish production. In the past, agriculture has been the main occupation of the Libyan people (see section 3.1). However, the prosperity of the public sector (e.g. administration and services sector, education etc.) and the discovery of oil have negatively affected agriculture. As income from agriculture became unattractive, many farmers migrated to the urban areas in search of better opportunities and higher income. Figure 8.12 shows the relative distribution of the Libyan labour-force by economic activity in 2012. It is clear that agriculture, fishing and forestry activities provide few opportunities to work for only a small percentage of the workforce.

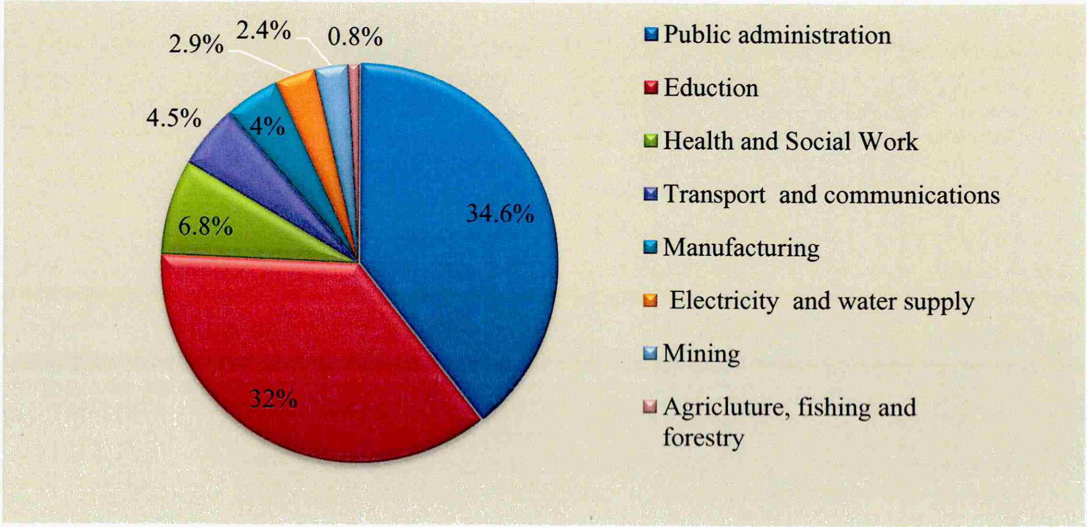

Figure 8.12: Relative distribution of the employment in Libya by economic activity in 2012.
Source: The Ministry of Planning, Department of Statistics and Census, Libya 2012.

Historically, work in fishing has not been popular among Libyans, agriculture and animal husbandry has been the traditional employment sectors with only small numbers of fishermen (see section 3.1). This may explain why the following table shows that since the 1970s, the proportion of foreign labour has been more than double that of Libyan labour in the fisheries.

Table 8.4: Distribution of Labours in the Field of Marine Fishing in Libya

Year	National employment	Foreign labour	The total	% National employment	% Foreign labour
1970	685	1392	2077	33%	67%
1980	862	1752	2614	33%	67%
1990	869	2738	3607	24%	76%
2000	2800	5000	7800	36%	64%
2007	3256	9201	12525	26%	74%
2008	4576	13344	17920	25.5%	74.5%

Source: General Authority for Marine Wealth 2009

Table 8.4 shows a shortage in the number of Libyans involved in the fisheries. In 2008 they made up no more than 4,576 (25.5%) of the total number of workers in this occupation, while foreign workers totalled 13,344, that is, 74.5 per cent of the total number of workers. In contrast to the above table, this study shows that out of 111 fishermen, 87 per cent are Libyans. Foreign fishermen, all of whom were from Egypt, do not exceed 13 per cent. It is possible that the non-Libyan fishermen have left the country because of the current political situation. Furthermore, the difference in findings may be expected by the fact that this study questions specifically boat owners. To confirm the data on table 7.5, the National Agency for Maritime Investment 2006–2010 report indicated that 65 per cent of fishermen are foreigners and that the Libyan ratio did not exceed 35 per cent. Based on FAO1's familiarity with the sector, he also agreed with the information in the report arguing that:

> From my point of view, one of the things that stand in the way of increasing fish production is the lack of national employment in the fisheries sector in Libya; it relies primarily on foreign labour.

The above assertion may have led to higher wages for foreign labour engaged in fishing, the result is low fish catch and distribution. Consequently, the price of fish increased due to scarcity. For example, WS1 observed:

> One of the big challenges facing fish marketing is the scarcity of products due to a lack of foreign labour.

Small scale fisheries also face the problem of higher wages for foreign workers specialising in fishing, due to a supply shortage. Accordingly, the role of the state should be firm in this respect; for example, a maximum and a minimum wage should be standardised and operationalised in the sector. In line with this, participant 60 suggests that:

> The law should set the pricing for foreign labour.

Many fishermen even state that they need to import foreign labour to support this sector. The importation of foreign labour to the fisheries sector in Libya could be an appropriate solution to support this sector in the medium term, but it should also be a source of employment to the citizens in the long-term. However, one could argue that importation of foreign labour will add to the already expensive price of fish. On the other hand, as production increases prices would decrease. On the issue of foreign labour, participant 3 noted the positive side:

> Providing specialised foreign labour to the fishing industry will help in the training of Libyan labour.

Participant 4 supported participant 3's suggestion:

> Bring Egyptian labour for fishing by Jarafat.

However, fishermen also pointed out that bringing foreign labour needs to be planned and done in line with Libyan migrant labour laws. The responsibility now relies on government to design a policy that is directly targeted at foreign fishing labour to boost the sector, as is currently done in science, technology, teaching, medicine and nursing. For example, participant 45 argued for:

> ...the adjustment of employment process, particularly in fishing.

It is clear that scarcity of employees is one of the many problems facing the fishing industry. The analysis of responses provided in the questionnaire administered to the fishermen in eastern region of Libya confirmed a labour shortage. Figure 8.13 below shows that 49.5 per cent of the respondents (55 subjects out of 106) believed that the main problem facing employment in fishing was a shortage of skilled labour; 23.4 per cent of respondents (26 subjects) stated that there is a scarcity of labour working in maritime fisheries; 10.8 per cent (12 subjects) regarded an increase in and high wages as a problem, while 5.4 per cent (6 subjects) of the fishermen agreed that the main problem faced by the small-scale fisheries in the study area is the high cost of employing foreign labour. Although the lack of a sufficient number of skilled fishermen in the artisanal fisheries in the eastern region is considered a disadvantage from Porter's point of view (1998:81-82), "competitive advantages can grow out of the selective factors of disadvantages. Moreover, there are disadvantages in the basic factors such as the labour shortages, domestic raw materials, or a harsh climate creates pressures to innovate around it". This issue will be further explored in the discussion chapter.

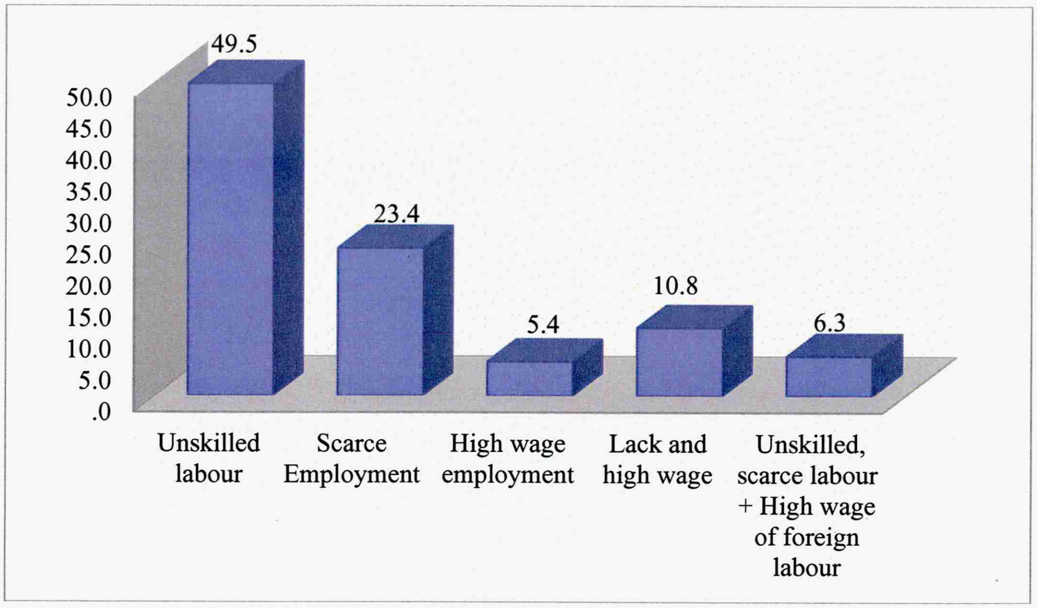

Figure 8.13: Employment problems.

B) The Characteristics of Fishermen in the Study Area

Figure 8.14 shows the age of fishermen: 55 per cent (61 subjects out of 111) of the sample were aged 26-45, followed by 27 per cent (30 subjects out of 111) whose ages range from 46-60. Only 14.4 per cent (16 subjects out of 111) of the fishermen were aged 25 or below. Around four per cent (4 subjects out of 111) of the fishermen were aged above 60. This variable has been examined because in some craft occupations there is a need for a certain type of effort at a certain age. This is a clear indication of an ageing occupation and a lack of desire on the part of the younger age group to enter this occupation; this age group is the most important in that they will bear the burden of work in this area in the future. The reluctance of young people to work in this sector may lead to more shortages of national labour in the future and the importance of young people lies in the fact that they could be targeted for financial support and training to provide manpower for this craft, and to have a field of work opened in front of them (Al arifi, 2008:191). If the conditions of service in the fisheries are deliberately made attractive, this will serve as a motivation, especially to unemployed Libyan youth, to move and make a livelihood in fishing. This is in consideration of the fact that at the onset of the 2011 Libyan crisis, unemployment was estimated to be around 14-20 per cent (Chami et al., 2012 ; Reuters, 2009), with young people aged between 18 and 29 years being particularly affected.

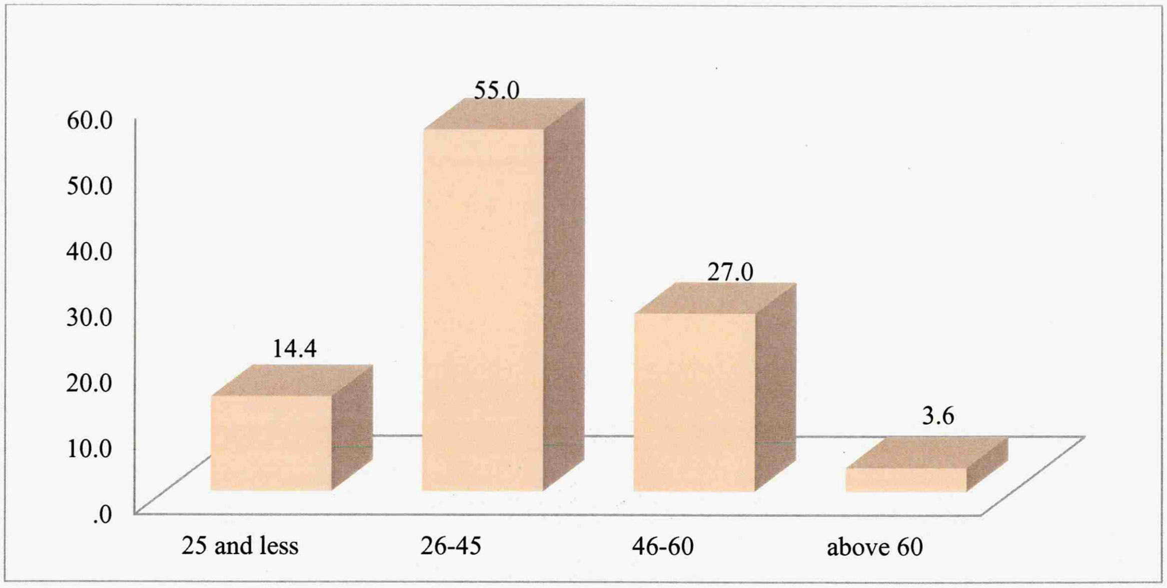

Figure 8.14: Age Distribution of fishermen.

The findings also showed that most participants in the research, 85.6 per cent (95 subjects out of 110) of the sample of the fishermen, had not received any training in fishing; neither did they have a degree from an institute specialising in fishing; thus, there was a lack of academic, professional and occupational training in this field. Only 13.5 per cent (15 subjects) of the sample of the fishermen have a certificate from a marine related education or training centre. There is a difference between skill and experience. Porter (1998) associated skill with highly specialist education in a specific field and confirmed that it is one of the ways for competitive advantage to be acquired. Although the findings of this study revealed that almost 41 per cent (46 subjects out of 110) of fishermen were educated to secondary level, 23 per cent (26 subjects) to preparatory level and 22.5 per cent (25 subjects) to university level. Further to this, 11.8 per cent (13 subjects) of the fishermen had no formal training or any kind of qualification whatsoever. No fisherman was recorded as having a higher qualification in the field of fishing or any related discipline.

Regarding the experience of fisherman, this study defines it as the number of years a fisherman has spent in the occupation of fishing. The findings as shown in Table 8.5 below indicate that the majority of respondents, representing 44 per cent (49 subjects out of 111) of the fishermen, were those whose experience in fishing ranged between 11-20 years, followed by 33 per cent (37 subjects) of fishermen who had between 1-10 years of experience, while 22.5 per cent (25 subjects) of fishermen had more than 20 years' fishing experience. This suggests that the fishermen who have more than 20 years of experience in fishing are the smallest group at present.

Table 8.5: Distribution of Respondents According to Fishermen Experience

Years of Fishermen Experience	Percentage (%)
1-10	33.0
11-20	44.0
21 and more	22.5
Total	100.0

Source: Field work

The Chi-square test was used to statistically examine the experience of fishermen in relation to fish quantity. Although Cramer's statistic of 0.198 suggests there is a correlation between fishermen's experience and the amount of production of fish; statistically, however, its impact is not significant (see Table 8.6 below and Appendix J table 3 (a-d) for the chi square results of experience of the fishermen). This is an indication that the younger generation of fishermen can have the same size catch as the more experienced fishermen. In other words, fishing appears to be an industry that supports the engagement of all working age groups. Although the experience of fishermen has an impact, it is not statistically significant. This signifies that as more heavy engines are utilised for fish production, there will be a corresponding increase in the catch to meet the demand for local consumption (which is expected to grow) and for export.

Table 8.6: Experience of Fishermen and its Influence in Fish Quantity

Dependent Variable	Independent Variables	Relationship between Dependent Variables and Independent Variables	
		Chi-Square	Cramer's V
Total Annual Production Quantity (tonnes)	Experience of Fishermen	$P = .069$	0.198

Source: Field work

C) The Satisfaction of Fishermen with Fishing as an Occupation

Part of the research was to specify the extent of satisfaction among Libyan fishermen working in the fishing industry. From the data analysis, 63 per cent (70 subjects out of 111) of the fishermen were satisfied with their fishing career, while those who were dissatisfied constitute 37 per cent (41 subjects) of the sample population. Findings in Table 8.7 also showed that the proportion of fishermen who have no other work (meaning that they depend solely on fishing as the only source of income) was 47 per cent (52 subjects out of 111), while the proportion of fishermen who had another income source was 53 per cent (59 subjects out of 111). Based on Lambert et al. (1999), the reason for collecting data about the fishermen's sources of income is to determine whether a career in fishing plays an important role in the economic life of the fisherman. While fishermen are satisfied with their jobs and would like to continue in this occupation, do labour conditions in Libyan fishing meet the standards set by the International Labour Organization (ILO) conventions and recommendations? In this regard, there was no respondent fisher who has been assessed according to the ILO standards; and therefore, the quality of labour conditions are largely self-regulated or haphazardly set, probably because the majority of fishermen operate at the artisanal or small-scale level. There is also the question of inducing fishers to give the work up for alternative occupations. This argument emphasises that fishing is a contributor to fishing crisis and the degradation of the world's oceans. To reduce this impact, those without reasonable levels of job satisfaction can be encouraged to find alternative means of livelihood (see Bavinck et al., 2012).

Table 8.7: Fishermen's Other Sources of Income besides Fishing as an Occupation

Other sources of income with fishing as an occupation	Percentage (%)
Yes	53
No	47
Total	100

Source: Field work

8.1.5 Knowledge Resources and Fishing Technology

Porter (1985:164) states that "technological change is one of the principal drivers of competition. It plays a major role in the industry's structural change, as well as in creating new industries". According to the development plan of the Libyan marine sector 2006-2010, the target to be achieved in this period is to increase the refreshing rates and technological development in the activities of the marine sector (National Foundation for Maritime Investment, 2005:32). However, there is a lack of personnel training in modern methods of fishing to achieve sustainability of this wealth and to keep it from attrition: this should be one of the important aims of the government plans. GR1 also demonstrated that the weakness of fish production is due to lack of use of the latest fishing technology. In addition, the quantities of fish production in Libya in general are low compared to those in neighbouring countries (see section 1.4). Some participants attribute this shortage in fish production to the use of primitive means in production and to the absence of modern technological means. For example, participant 109 confirmed that:

> The lack of institutes that teach fishing or awareness programmes that develop the capacity of the fishermen lead to the inability of fishermen to use and keep up with evolution in fishing processes.

This was confirmed by FAO1:

> There are many reasons for the weakness in fish production such as a lack of fishing skills, the continuing use of traditional fishing methods and a failure to deploy technology in fishing.

Many of the participants – fishermen - in this study emphasised that the methods of fishing they use are traditional, such as the use of Alsartma and Alsnar nets. The modern methods and technologies of fishing do not really exist in the fishing processes on the eastern coastline of Libya. Fishing boats are not equipped with power engines appropriately. In addition, there are no modern detection devices to help fishers locate the whereabouts of fish or other technologies useful in the fishing craft. Only a small number of fishermen, not exceeding 4.5 per cent of the respondents, use modern devices such as GPS detectors to measure the depths and to identify the whereabouts of fish at various depths. The acquisition of such devices saves time and effort for the fishermen; it helps to increase their productivity as well. One of the few fishers adopting latest technology claimed:

> I have a device to measure the depths (askendil), a GPS device, and a compass to determine trends.

In contrast, FM2 observed that:

> The small boats do not have any modern equipment; however, large boats have a compass to identify trends.

Data from the questionnaire survey also support these findings. Based on the responses, 82.9 per cent (92 subjects out of 108) of the fishermen in the sample maintain they do not use any modern or technological method. Only 14.4 per cent (16 subjects out of 108) say they use some of the equipment and devices mentioned above. The responses also showed that there is failure to maintain fishing areas, which are considered among the most important components of the infrastructure of the fisheries marine environment, due to the use of illegal fishing methods such as explosives. It was found that 15.5 per cent of the fishermen use dynamite in fishing, even though it is illegal: it is used by some fishermen to make a quick profit. Dynamite fishing injures and kills fish and destroys the habitat for other marine life. This devastating form of fishing should be addressed by the relevant authorities before it constitutes a serious problem for the industry, as it does in Tanzania. Blast fishing has become so rampant in Tanzania that it is now done with a vengeance to increase the fish catch. According to Wells (2008), blast fishing is lucrative as a short-term profit- making strategy, but it leaves long-term devastation. He added that "in 2006, one stick of dynamite costing US$ 5-6 could lead to a catch of up to 400 kg of fish with an estimated sales value of US$ 400–1,800" (Wells, 2008:21).

In relation to the findings that came out of the human resources discussion, figure 8.15 summarises factors affecting workers performance and fish catch productivity, one of which is the absence of modern technology. The marine resources sector in general suffers from a decline in the number of workers and there is also unwillingness among the younger generation to enter this occupation. Further and as already mentioned, the employment rate of nationals is very low compared to that of foreign employees, and there is the issue of workers' low level of skills and specialisation because of the lack of training programmes and specialised education. Workers are not introduced to technology despite the fact that most of the fishermen were educated outside the area of fishing. Therefore, specialised education and the use of technology are necessary to upgrade and develop this sector.

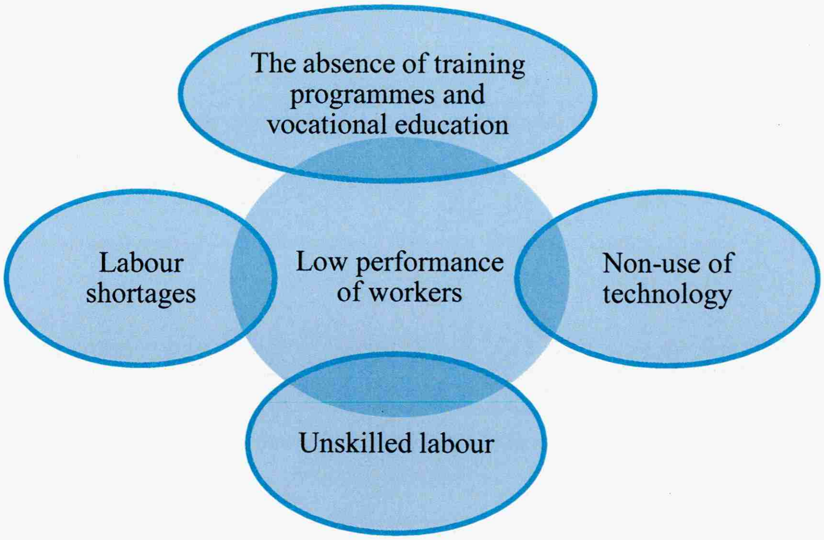
The absence of training programmes and vocational education
Labour shortages
Low performance of workers
Non-use of technology
Unskilled labour

Figure 8.15: Factors affecting workers' performance on small-scale fishery in the eastern region of Libya.

8.2 Fish-Marketing Practices and Structure of Markets of the Eastern Region of Libya

An effective fish marketing system ensures the availability of fish to consumers at the right time, in the right place and at the right condition. In addition, the features of the local market are important for achieving competitive advantage because it determines the quality of the goods. According to Porter (1985), the value chain is based on an analysis of a series of interrelated activities performed by the company; they can be used to help identify the sources of competitive advantage for a firm. These activities fall into several types: primary activities and support activities which are essential for the development of fisheries (see section 5.2.1, c) where competitive advantages rely heavily on the presence of an effective system. To improve the level of fisheries productivity, there is need for effective marketing operations along with efficiency in fishing activities and effective policies. In relation to the aspects of fish that are identified as constituting impediments to the growth of the fishing industry in Libya, this study used field data to analyse some of these aspects; this includes: supply channels, fish handling, outlets for fish display and pricing.

A) Supply Channels

It is important to identify the channels of fish distribution. Part of the market structure involves identifying the paths of fish distribution and the channels whereby the fishers catch is received. It is also necessary to consider how easy or difficult it is to get buyers for the quantities produced and whether or not there is a good system of marketing channels to ensure that the fishermen and all the episodes of distribution can reap the benefits of their efforts. For example, FM2 explains that fish supply passes through four supply channels:

> The fisherman sorts the catch, presents it to the wholesaler, and then the wholesaler sells the fish to itinerant traders and then it is sold to the consumer.

The respondent further observed that in some cases:

> Some of the fishermen sell their products directly to fish retailers.

The fishers were questioned about the channels they used to market their fish. From the sampled population (figure 8.16), 44.1 per cent (49 subjects out of 109) of the fishermen confirm that they sell their fish to a wholesaler; 17.1 per cent (19 subjects) sell their fish directly to the consumer; 5.4 per cent (6 subjects) of the fishermen sell their fish to a retailer; 0.9 per cent (1 subject) of the fishermen sell their fish to consumers and retailers, and a total of 30.6 per cent (34 subjects out of 109) state that they sell their fish to a combination of all three - wholesalers, retailers and consumers.

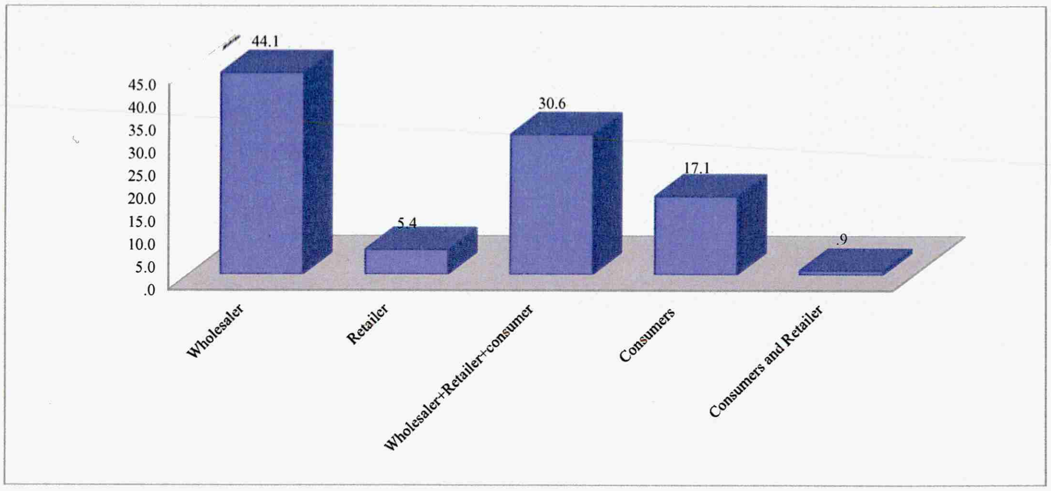

Figure 8.16: Channel of fish sales.

This was corroborated by the eight structured interviews conducted with fish retailers about sources from which they get their supply from. The fish retailers also confirm that five of them buy their fish from the wholesaler while three of them buy their fish directly from fishermen. The questions asked after this addressed the matter of subsequent channels in the chain. Five out of eight respondents state that they sell their fish to the consumers i.e. for consumption in the family home, while three retail shops state that they sell their fish to consumers and hotels. Participant 8 added:

> I sell the fish to individual consumers and the hotels; I also sometimes export the fish through agents though.

Rather than focus on the domestic market, some individual fish suppliers export their fish abroad. These fishermen export their fish, in a raw, fresh state, to neighbouring Tunisia, from where it will be either processed or handled and exported to European markets as Tunisian fish. The reasons behind this uncontrolled channel of fish export are discussed in more detail in section 9.4.

The findings of the study showed that marketing channels are not visible in all the cities of the eastern region of Libya. For example, FR2 pointed out:

> The fish marketing channels in Libya are not clear or visible.

Figure 8.17 below is a diagrammatical representation of the distribution chain of Libya's fish catch as revealed by respondents during the fieldwork. One fascinating aspect of this distribution channel is that Libyan fish is sold to Tunisia and then Tunisia either exports the fish to the EU or to Libya. The Libyan fish that was exported to the EU via Tunisia can sometimes come back to the Libyan market as EU fish for Libyan consumers to buy.

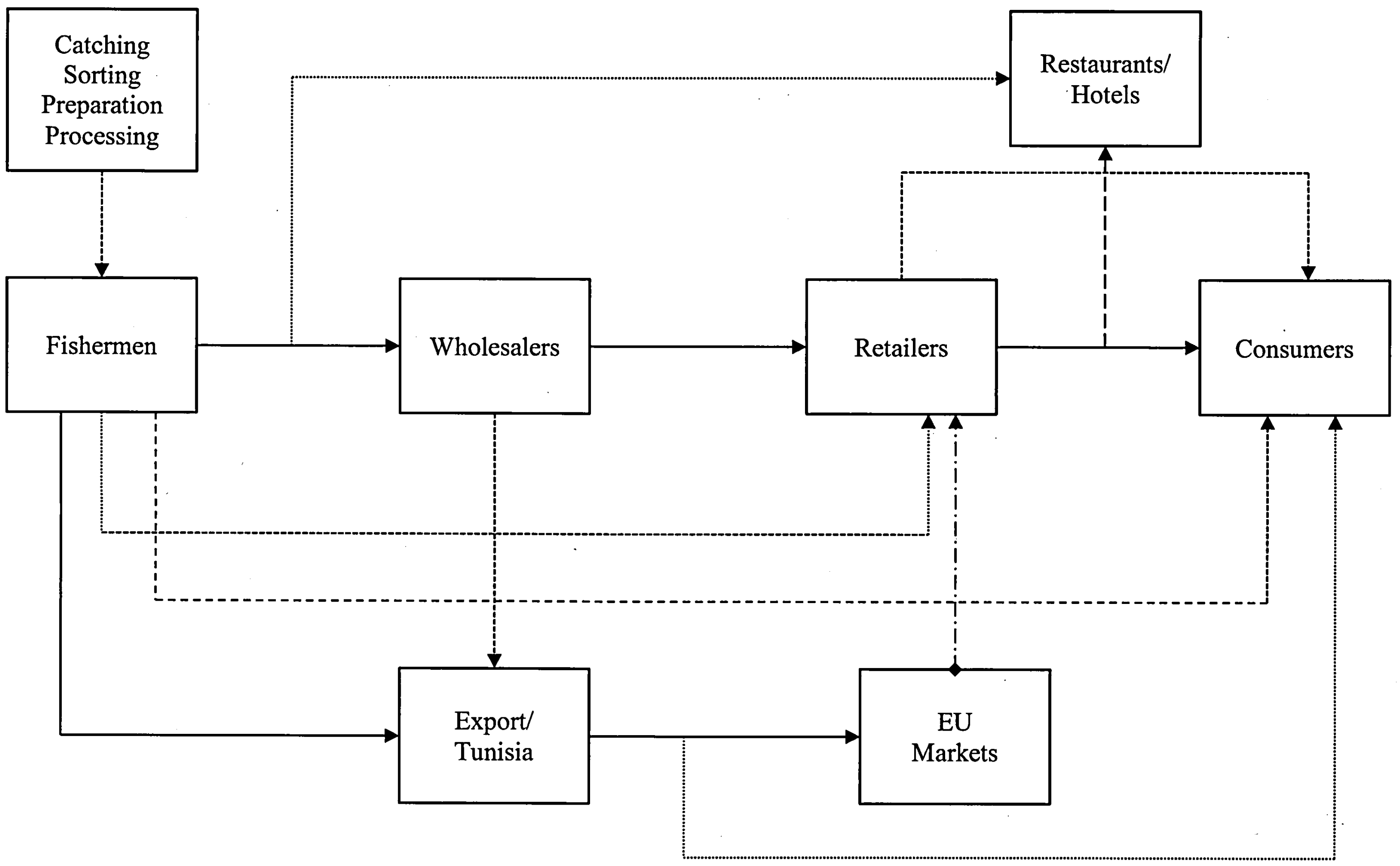
Catching
Sorting
Preparation
Processing
Fishermen
Wholesalers
Retailers
Consumers
Restaurants/
Hotels
Export/
Tunisia
EU
Markets

Figure 8.17: Fish distribution channels based on fieldwork responses.

From the responses gathered from the fishers and vendors one could describe the fish distribution channels as follows:

1- From the fisherman to the wholesaler to the retailer and then to the consumer.
2- From the fisherman to export to Tunisia then re- export to the EU.
3- From fisherman to wholesaler to export to Tunisia then re- export to the EU.
4- From fisherman to the retailer to consumer.
5- From fisherman to the retailer to hotels or restaurant
6- From fisherman directly to consumer.

Furthermore, there is a wholesale market for the sale of fish in the city of Benghazi. However, traders from other cities who are involved in the study indicated that there are no wholesale markets in their cities. In some cases, one, two or more of the channels may disappear and the brokers may find themselves without work. The standardisation of fish distribution logistics and operations may be responsible for the success of the marketing process. In line with Nordin (2005), any developed marketing and logistics processes guarantee product availability, information flow, an effective ordering process and an efficient delivery service to customers.

B) Fish Handling

Fish is a very sensitive commodity and is subject to rapid deterioration, thus the process of fish handling needs to be carefully monitored. Fish marketing and quality control are two sides of the same coin. According to Mgawe and Diei-Ouadi (2011:iii): "poor fish handling and processing practices as well as ineffective means of preservation and marketing cause huge losses in terms of physical, quality and market force losses". From the current study's findings, we can state that one of the factors that affect fish quality is fish handling that starts immediately after harvest. Interviews with fishermen gave similar answers about the initial processes that are usually carried out by fishermen after they arrive in harbour with their catch. FM2 explains how he handles fish immediately after catch:

> The phase of preparing fish for marketing begins from the time when the fish is brought to the landing sites, where the fishermen start removing the fish from the nets. The fishermen begin to collect fish, employing young people who are jobless; they help the fisherman remove the fish from the nets. After that, the fishermen sort their catch by the type and size of the fish and put them in boxes.

This comment is similar to the response made by FM1:

> Fishermen usually bring their catch to the landing site and start sorting fish with the help of some other people, then put the fish into boxes.

The comments made by FM1 and FM2 reveal that fish is handled by fisherman and people (often volunteers and unpaid family labour), who might have no knowledge or experience in fish handling. It may be recalled that a low level of knowledge in the ways of handling fish reduces its quality thus its price, and that this may lead to contamination, increase material loss, expose fish eaters to polluted fish and result in an incremental loss to the fishers. Requirements for the process of fish handling include temperature, the accessibility of ice in transportation and the means to keep fish fresh in the outlets of the fish display. This task of keeping fish fresh starts directly after fishing. It is the fishermen's role to keep their fish fresh and in good quality until it is delivered to traders, wholesalers or consumers, as the case may be. The vendor has to ensure that the fish reaches the consumer in high quality and with nutritional value. Any break in the cooling chain can result in irreversible damage to the quality of fish. This means important decisions relating to storage facilities, truck design and capacity, as well as supply patterns, will be required to meet fish safety regulations (De Silva, 2011).

The findings disclosed that most fish vendors trust their level of knowledge regarding the ways in which to keep fish in good condition. Seven of the fish retailers believe that they have a high level of knowledge of methods to keep fish fresh, while only one out of the eight fish retailers considers his level of knowledge to be just good enough to keep the fish in saleable condition. As regards refrigerated transport vehicles, these are essential to transport fish from place to place, especially in Libya where the distance between the coasts and cities is usually far and the weather is usually hot. Due to this constraint, most fish retailers (seven out of the eight participants) have refrigerated vehicles to keep fish fresh; only one fish trader did not own such transport, and usually hired a refrigerated van to transport his fish; or the wholesaler takes responsibility for delivery.

On the positive side of fish handling, the refrigerated vehicles for the transportation of fish are available in eastern region of Libya. This was confirmed by FM1, when he states that:

> There are means of transportation that fit what is necessary for the fish.

In addition, although the majority of respondents in the study have refrigerators in their shop to keep the fish, many shops are equipped with out-dated refrigerators used to keep the fish fresh. (See figure 8.18 below).

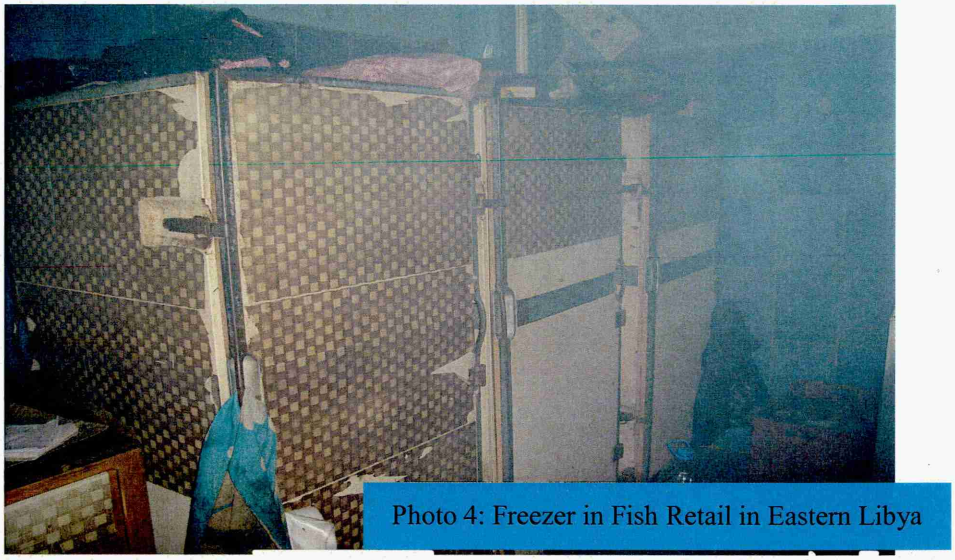

Figure 8.18: Image of an out-dated freezer in a fish retail shop in eastern Libya.
Source: Study's Field work.

Ice should be made available to keep fish fresh; however, the study found that there is often insufficient quantity of ice for both the fishermen and fish vendors to keep the fish in good condition. For example, FM1 said that:

> Ice is not available in most of the ports of the eastern region; there is a scarcity of ice plants as well.

This was corroborated by fish retailers. When asked if it was easy to obtain ice or not, six of the fish traders said that they found it difficult to obtain ice (see figure 8.19). The two participants who said it was easy to obtain ice are retailers from the city of Benghazi. Ice is necessary, especially for conserving fish during display.

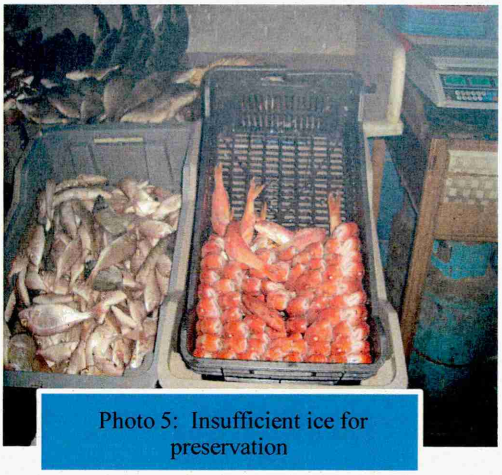
Photo 5: Insufficient ice for preservation

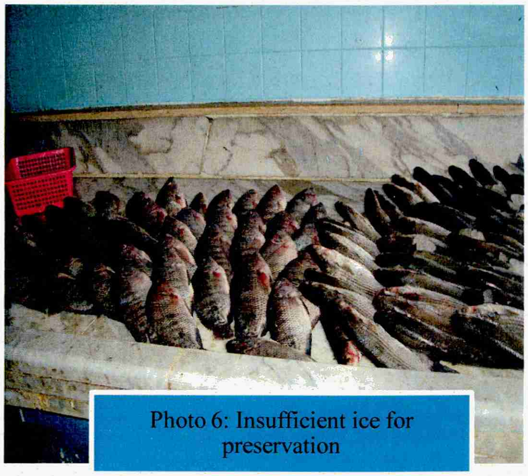
Photo 6: Insufficient ice for preservation

Figure 8.19: Images of fish retailing with insufficient ice for preservation.
Source: Study's field work.

As mentioned in chapters two and three, Libya suffers from corruption that has impacted negatively on the processes of the production and marketing of fish. For example, RF1 criticised the government for neglect:

> Public fishing companies were neglected; therefore, they could not achieve any success. This resulted in damage to the infrastructure of the cooling pools and ice plants and tunnels of freezers.

EMC confirmed RF1's argument pointing to corruption and negligence in the management of fisheries when he said:

> Although the government established many ice plants, a lack of control was a problem; the negligence of the government hindered many projects. For example, the coastal city of Tobruk has a public company for marine products which was owned by the state and it has four ice factories, none of which are working. On the other hand, the two privately, citizen-owned ice factories are working.

This instance shows that the government should support and encourage investment in the private sector in all aspects of fisheries processing, preservation, transformation and value addition, because it seems more successful than the public sector.

C) Outlets for Fish Display

It is certainly difficult to describe the structure of the fish market in the eastern region of Libya. One of the retailers, an expert in this area (RF1) argues that:

> In Libya in general and in particularly, the eastern region, one cannot describe the process of fish marketing as an orderly marketing system in anyway.

According to FAO (2014:3), population growth, rising incomes, urbanisation and migration is currently facilitating the expansion of fish production and more efficient distribution channels in countries where fisheries are a well-organised business. This situation is not the case in Libya as findings from this study shows that fish markets in Libya did not receive proper attention to achieve appropriate development comparable to what is happening in the region and the world in general. In support of the facts presented in section 3.2, RF2 states that:

> Although the situation has changed for the Libyan citizen in terms of increasing awareness of the importance of fish and white meat, the fish trade remains stagnant.

Regarding the wholesale fish markets, there is only one wholesale market in the city of Benghazi out of the four cities covered by this study. However, there is no specialised market for the sale of fish in the eastern region of Libya (the study area) at all. Disenchanted by the current state of unorganised fish marketing, RF1 complained:

> The facilities of the wholesale fish market in Benghazi do not live up to the required level. There is no specialist wholesale market.

According to the development plan of the Libyan marine sector (2006-2010), the existing sites for selling fish in Libya are traditional markets, some of which are huts or shacks built of tin or wood (see figure 8.20); appropriate places to display and sell fish in a healthy manner are not available (National Foundation for Maritime Investment, 2005: 25).

RF2 observed that:

> In the eastern region, there is no large market to sell the fish. What there is lacks many facilities such as air conditioning, surveillance cameras, a municipal guard to prevent smoking and inappropriate waste disposal and to monitor the extent of fresh fish, including what is available such as in the new fish market in the city of Tripoli.

See figure 8.20 images of fish marketing in Benghazi. Fish marketing involves many people at different stages – from the catch to the markets before arriving at the final consumer. This figure shows fish traders selling to the final consumers.

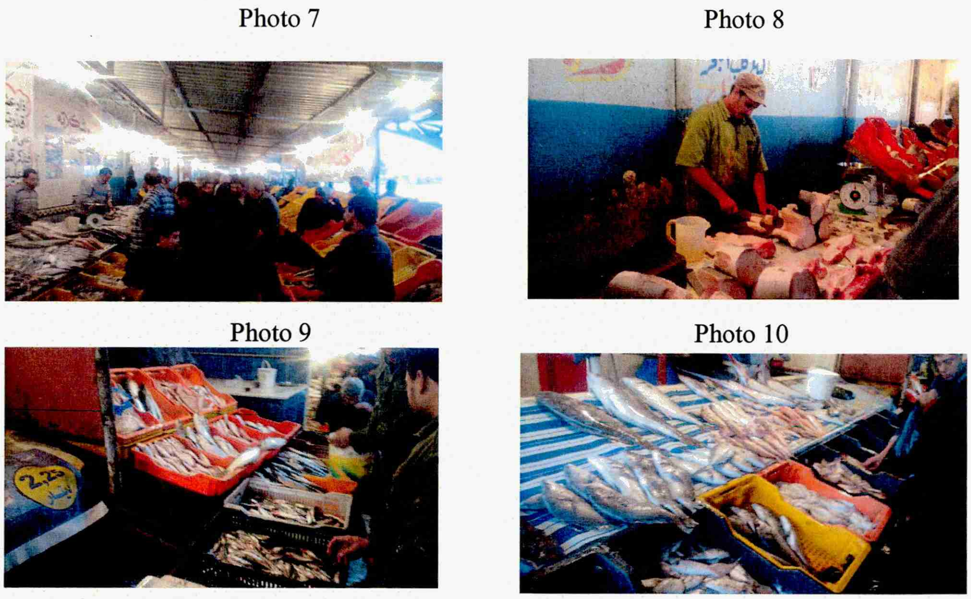
Photo 7

Photo 8

Photo 9

Photo 10

Figure 8.20: Images of fish marketing in Benghazi.
Source: Study's Field work.

The findings showed that four (4) fish retailers from the sample display their fish in shops in the market, while two of the participants own and use both shops and vans to sell their fish; and a further two of the participants sell their fish in shacks (see figure 8.21). One of vendors, RF2, who describe the places for the sale and distribution of fish, said that:

> Outlets for fish display, both these shops and stalls, are not certified or appropriate for selling fish.

The problem is that because the stalls are open and exposed to the sun and air, the fish is exposed to heat and flies, thereby damaging it and subjecting it to contamination that could present public health hazards.

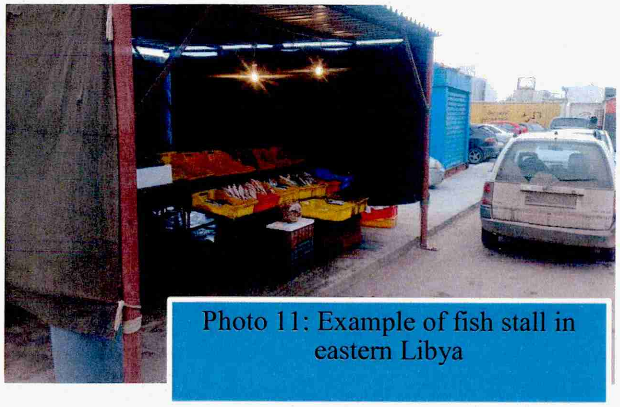
Photo 11: Example of fish stall in eastern Libya

Figure 8.21: An example of fish stall in Eastern Libya.
Source: Study's Field work.

Additional services for the distribution outlets include services that can add to the value safety and quality aspects of the product, to help increase consumer demand for any commodity. There are many services that can be added to that of fish production. The findings show that four retailers offer additional services to fishing; these included cleaning the fish in addition to the sales process; one other retailer cook, grill and fry the fish; and the rest of the retailers in the sample sell their fish without any other preparation. The owners of the fish outlets were all Libyans; however, most of the employees carrying out the sales operations or performing additional services such as cleaning, grilling or frying were migrant workers from neighbouring Arab countries, with the majority from Egypt.

D) Pricing

According to the development plan of the Libyan marine sector 2006-2010, there are four main methods for the sale of fish products in Libya: open auction sale, where the product goes to the buyer who offers the highest price; negotiation, where there is an agreement on price between the seller and the buyer; fixed pricing, that is, a pre-determined price by competent authorities; and finally, contracting, where there is an agreement on the provision of fish at the price agreed upon by the two parties (National Foundation for Maritime Investment, 2005:25). The most common practice is to negotiate prices. Field investigation revealed that fishers, wholesalers and retailers do not take into account the price of fish set by the government. Fish pricing depends on many factors. One of the most important factors determining fish prices in Libya is the fish species as there are many types of fish found on the eastern coast of Libya. In this regard, FM2 states that:

> The trader buys the catch and prices it according to the type and size of fish. It is the wholesaler who determines the price of each type of fish.

In addition, the findings illustrate that the seasons of the year have an effect on the abundance of the fish harvest (Figure 8.22). Responses gathered indicate that 36 per cent (40 subjects out of 109) of the fishermen believe that the most important season in the eastern region, in terms of earning a higher income, is the summer. Because of the well-defined warm layer of water over a cool one that characterises Mediterranean waters in the summer, fish migrate to these areas to find warmer water for productivity and high oxygen levels.

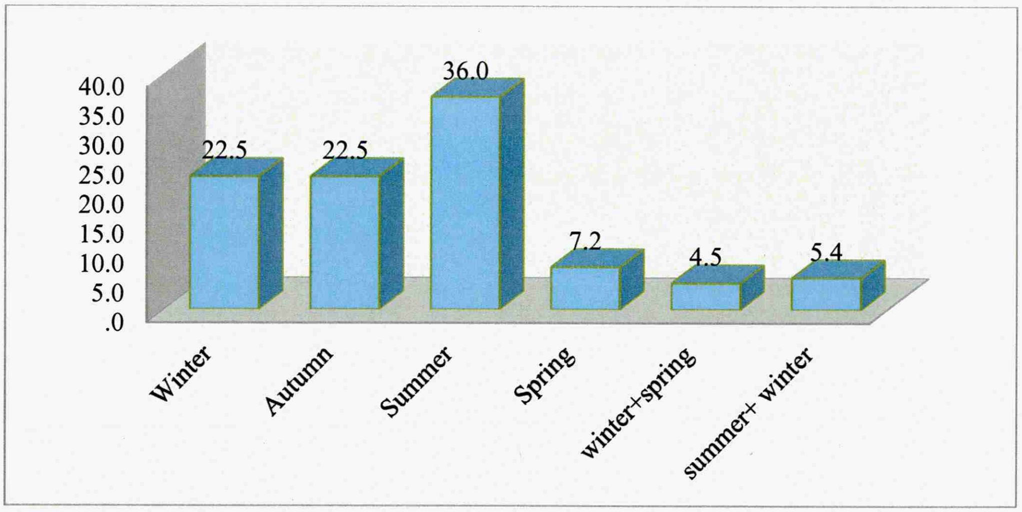

Figure 8.22: The Effect of the seasons of the year on the abundance of the fish harvest.

There was an equal percentage of fishermen, representing 22.5 per cent (25 subjects out of 109), who believed that the most important season in the eastern region in terms of earning a higher income is the winter or autumn. This could be due to the rise in price of fish due to poor weather conditions in the winter. This is followed by 7.2 per cent (8 subjects) of fishermen, who indicate that they usually earn more by fishing during the spring period. Around five per cent (6 subjects) of fishermen prefer both winter and spring seasons because they bring more profit, while 4.5 per cent (5 subjects) of fishermen prefer to catch fish in the summer and winter. Similarly, different equipment is used as seasons change. For example, weather conditions determine the rate of consumer demand for fish from the retail sellers, which affects the price of fish on the market. With respect to pricing, the fishers are at the mercy of the wholesalers, who in most cases set the price per kilogram of catch. This was attested to by FM1 when he states rather casually that:

> It is the wholesaler who sets the prices, depending on the fish types.

Even though fishers are not happy with this arrangement, they have no choice because if the catch is not sold according to the speculative price of wholesalers, the fish is either sold at a loss or will be left to rot. This means that with the right pricing policy, fishers will be well motivated to increase their catch and sell it at an approved price.

Going back to the seasonality of catch, RF1 also observes the changes that can be noticed in the productivity of fisheries and fishing areas as a result of the changing weather:

> Fishing operations in Libya are subject to weather conditions which are mostly seasonal.

There are many factors affecting fish price in the study area. This was compiled from individual responses. For example, WS1 and FR2's statement only expresses the simple demand and supply principles in fisheries:

> The prices often depend on the supply and demand for fish. In the case of a decrease in the fish supply and an increase in the demand, prices will rise.

Also, WS1 seemed to agree when he noted:

> Prices depend on the demand in the retail sales, the weather conditions and the time of marketing during the day.

It was documented in section 5.3.1 that culture and tradition have an influence on food choice. This statement about how tradition affects fish consumption in Libya was confirmed by RF1:

> The culture of fish consumption among the Libyan people differs from most of the peoples in the surrounding region. The consumption of fish is not considered an important food or a primary source of animal protein.

The above quote therefore confirms Grivetti's (1997) and Shepherd (1989) assertion that cultural and religious beliefs have a profound impact on food selection. What is likely to change this perception is immigration, a rising living standard, healthy eating awareness and possibly pricing. There are other factors that affect fish prices. Fish export has an effect on fish prices. For example, RF2 observed:

> We found that during the export phase, sale prices were high, thus encouraging local fishermen and motivating them in the practice of fishing

Furthermore, WS1 states that:

> Fish quality also is one of the factors that determine the price of fish.

Factors affecting fish price in the study area are summarised in table 8.8.

Table 8.8: Factors affecting fish price in the eastern region of Libya

	Variables
Factors affect fish price	Types of fish
	Season and weather
	Consumer demand
	Culture
	Export
	Time of the day
	Fish quality

Source: Study's Field work.

When wholesalers were asked about the problems facing local fish marketing in Libya generally, WS1 responded this way:

> Instability of selling prices, lack of product due to lack of exports, while low selling prices sometimes because of the intensity of supply and low demand, and vice versa at other times, also lack of awareness of the benefits of fish consumption.

Another example given by WS1 is that:

> We should focus on increasing awareness of the benefits of fish consumption among citizens this is the major problem facing local marketing. In a country like Libya, with a lot of water for fishing, you would suppose fish meals to be popular.

Overall, the analyses conducted in this section suggest that there are key factors that have an influence on fish in the eastern region of Libya. Each of these factors has an effect on demand, production, distribution and consumption of fish, and the overall competitiveness of the sector to the Libyan economy. This means that competitive advantage of fish is dependent on how efficiently and effectively the above factors are used and their conditions (the quality, significance and shortage) are in a chaotic and less-developed state. It also means that making the above factors in a favourable position for fisheries is an enormous task. This section ends the first part of this chapter. The second part contains an analysis of related supporting and complementary industries.

8.3 Related Supporting and Complementary Industries

Drawing on section 5.2.1C, related and complimentary industries are those firms that coordinate or share activities in the supply chain or those that involve complementary products. The main industries related to fishing are ice plants, boat and gear factories and fish-canning factories. Competitive advantages can benefit from robust supporting industries and good quality infrastructure. Related supporting and complementary industries were also found to have an impact on fish production in Libya. The findings of the study confirm that the infrastructure of related supporting industries of fisheries in Libya is, on a whole, weak and that this is one of the major barriers that hinders Libya from benefitting from its fisheries sector. For example, the development plan of the Libyan marine sector 2006-2010 (National Foundation for Maritime Investment, 2005: 31) states that:

> Poor infrastructure and a poor support services sector are some of the major problems and difficulties that are facing the activities of marine resources.

First, with regard to cooling units in Libya, the number of existing refrigeration units stands at 17. The status quo is such that cooling units operate only sporadically, and there is a need to maintain and develop them when one of them is not working. It should be noted that the Libyan climate, large landmass and the long distance of distribution necessitates refrigeration of fish before it reaches distributors, retailers or consumers. Refrigerating units built on the coastline of Libya are completely dilapidated (National Foundation for Maritime Investment, 2005:29). Furthermore, the officer of Marine Resources in the Albeida office states that:

> In the eastern region there are four crushed-ice factories that belong to the public sector, they are not working, and there are three 20-foot refrigerators belonging to the public sector, and two private crushed ice factories that are working.

Secondly, regarding the boat factories; the development plan of the Libyan marine sector 2006-2010 states that there are eight boat factories that belong to the public sector and one factory that belongs to the private sector (National Foundation for Maritime Investment, 2005:29). The production capacity of all public sector companies is very weak and barely working, unlike the private sector factory which is running very well. The experts who drew up the plan attributed this situation to several factors, including the inability of domestic production to compete with imported products in terms of price and quality. At some point, precisely during the UN Sections on Libya, the transfer of ownership of factories led to work stoppages because of inability to meet operating requirements i.e. the canneries are dependent on imported raw materials from abroad. As the report further asserts:

> All the inputs of the fishing activities in Libya are imports and cannot be manufactured in Libya. The Libyan market is limited; it has witnessed rising costs of production.

The results of the field study gathered in 2011 shows that these goals have not yet been achieved and there were no concrete results. For example, participant (10) stated that:

> The government should establish integrated ports and harbours for fishing and factories for boats and fish canning.

The government representative (FAO1) during the interview maintained that there are many complementary fish industries but these require appropriate policy support investments thus:

> There is potential to establish complementary industries, however, there are many things to be put in place for these to operate effectively: ice plants, handling equipment, and factories for fish canning, fish preservation, fishmeal, fish oils, and plants for other products such as fish fillets and canned seafood. This also requires support for financial investment, the amendment of some investment legislation, the opening of internal and external marketing channels and awareness campaigns directed at the consumer and the producer.

The above quote implies that the fishing industry is not for the government alone as private individuals can come in and also develop the infrastructure. To do this, there must be government backing at all levels. Because of poor support and the limited participation of private fishing enterprise, there is only one factory for canning tuna in the eastern region, based in Benghazi. Some fishermen and traders complained of the occasional difficulty in the discharge of their production. For example, FM1 declares that:

> There are insufficient ice factories in the eastern region and fish canning factories in the eastern region, thus anything that is left over from the production we distribute to friends and neighbours otherwise it will deteriorate and be thrown away as waste.

Furthermore, other factories related to fisheries, such as ice plants, are also necessary to support other industries in the fisheries sector. FM2's comments show how hopeless the situation is:

> We hope that the state establishes ice- and fish-canning factories. It should be noted that in the eastern region, there is nothing available to improve the fisheries sector. We hope that this new revolution will pay attention to fishermen.

Fish is a sensitive commodity and this needs to be acknowledged; special stations specialising in this area are required along with operations carried out under certain conditions that meet international standards. For example, RF1 called for improving the competitiveness of the sector both for home and international market:

> The establishment of fish processing plants in accordance with European standards and under the supervision of the European Common Market for the purpose of providing an opportunity for the arrival of Libyan products onto global markets.

Industrial investments that are related to the fish industry in Libya remain dependent on import. Moreover, they ignore backward and forward linkages; they thus restrict prospects for development and growth in the fish industry. The results of the study demonstrated that the majority of participants consume canned fish such as tuna and sardines as snacks.

The development plan of the Libyan marine sector 2006-2010, mentions that the boat factory buildings which belong to the public sector in Libya are in good technical condition, but their machinery is not working (National Foundation for Maritime Investment, 2005:27). For example:

> There are two boat manufacturers in the eastern region; one factory for wooden boats, in Tobruk, and the second, a factory manufacturing fiberglass boats in Benghazi, but they stopped working a long time ago. Unfortunately, they have not operated efficiently since their establishment, for different reasons: institutional instability, where the subordination of factories moves to multiple destinations at frequent intervals which made it difficult to set up programmes and plans of action to run the factories, and weakness of financing.

Despite the technical state of most wooden boat factories, they have been patronised considering the lack of choice available to buyers. These factories have not run efficiently since their establishment for several reasons. First, there are administrative problems. It was impossible to prepare a plan or a programme to run factories due to management problems and the subordination of these factories to different legislation and regulations. The second reason is the weakness of the financing operations and the complications related to wages and salaries and labour turnover. The third reason is the high number of administrative workers in public sector boat factories.

According to development plan of Libyan marine sector 2006-2010 there has not been efficient exploitation in the area of fish canning (National Foundation for Maritime Investment, 2005: 27-29) because:

- Most factory machinery and equipment well past their working life and factories have not kept up with the technical advances of modern canneries.
- There is low financial allocation to provide the requirements for operation and raw materials.
- Domestic production is not able to compete with the imported products (e.g. canned tuna) in terms of price and quality in some cases.
- The transfer of ownership of factories and the inability to provide the operating requirements and do periodic maintenance has led to the deterioration of most of the machinery and equipment, causing the transfer of specialized expertise to other administrative bodies.
- Adoption of the fish canning factories for raw materials imported from abroad (tuna and empty cans, cardboard, etc.) to be placed without an appropriate

mechanism to enable a continuous flow of goods, which leads to a halt in production or running below capacity.

The findings that came out of the analyses from respondents of key factors influencing related supporting and complementary industries are summarised in figure 8.23. Firstly, there is a limited domestic market for fish consumption but this is expected to grow. Secondly, fish production comes with a high cost of production which is passed on to consumers. Thirdly, there is insufficient skilled manpower in the fisheries sector. Fourthly, there is lack of infrastructure and where available it is dilapidated and underdeveloped. Fifthly, institutions regulating fisheries are unstable and unable to supervise and enforce relevant laws. Sixthly, the limited facilities provided, such as the harbours, have been poorly managed by government agents over the years. Finally, the lack of funding is affecting all six factors mentioned above.

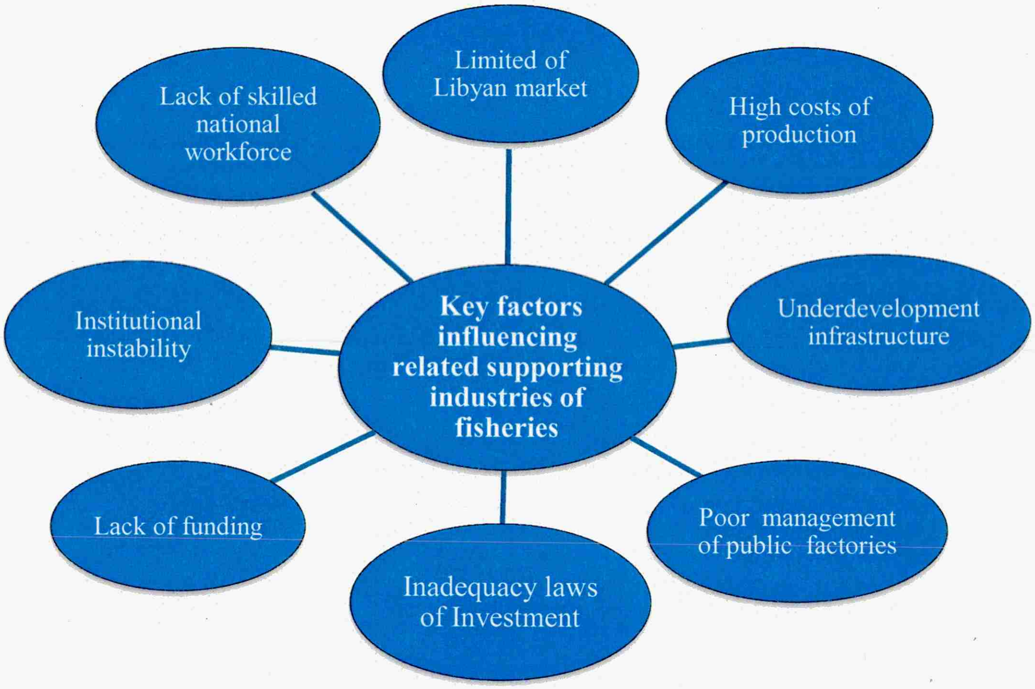
Limited of Libyan market
Lack of skilled national workforce
High costs of production
Key factors influencing related supporting industries of fisheries
Institutional instability
Underdevelopment infrastructure
Lack of funding
Poor management of public factories
Inadequacy laws of Investment

Figure 8.23: Key factors influencing the related supporting and complementary industries in fisheries.

8.4 Summary

This chapter has analysed opinions about factor conditions together with supporting and related industry in Porter's diamond model. Responses gathered enumerated a number of conditions working for and against the competitiveness of fisheries in Libya. Geography is an important element in the location of fisheries. Libya's strategic location along the Mediterranean coastline has provided it with abundant physical/marine resources – a factor condition that provides a competitive advantage – but this has not been harnessed, partly attributed to the huge revenues earned from oil sales. Poor infrastructure development has been a major factor in fishing. Improving fish infrastructure reduces cost of production and facilitates trade expansion. Expansion or improvement in quality of infrastructure in the harbours or throughout the value chain lowers costs, and raises the minimum efficient scale of production, transportation and marketing. A lack of adequate technology as indicated in this chapter can lead to a staggering proportion of losses in all operations from harvesting through handling, preservation, storage and processing, to transportation and marketing. The use of technology to obtain a competitive advantage is very important in today's technologically driven environment. Technology can be use in production to reduce cost thus add value, or in research and development to preserve the quality of fish over a long period, considering the climatic conditions of Libya.

To stimulate innovation advocated by Porter, there is the need for superior infrastructure in the form of creating fish technology nucleus that focuses on industrial research and development. This centre can be supported with development, production, and marketing services for innovation that originates from academic and organisational research, but operating under business environment. For the fishing industry to be competitive, the sector will have to source, recruit, train and develop the correct manpower for the sector. One of the ways that will provide formal skills and labour required to move any innovation and change in the fishing industry is by opening fisheries training centres or in affiliation with universities. As findings indicate that manpower in the fishing industry is ageing and those in the sector are neither educated nor have undertaken any formal training, this centre will attract and train the best brain power in the region from the early stage and produce the skilled worker.

Fishers will have to be motivated and paid the 'market rate' of their entitlement and of their product, if they are to be motivated to remain in the sector and add value to it. In terms of pricing, fish appears very expensive compared to chicken or beef. Some of the factors responsible for high fish price include fish species, season, quantity, ice, laws and regulations, labour weather, export and culture. While some of these factors can be resolved as the industry is developed (i.e. as mentioned above), other elements might be difficult to change (e.g. cultural barriers to fish consumption). However, population growth, immigration and proximity to neighbouring countries and EU markets have formed an alternative favourable export market. The public sector in fisheries not only dominates the private sector but prevents it from participating. Insufficient databases about fish stocks, inefficient infrastructure of the domestic market, inappropriate policy framework and legislation, weak and unstable institutional arrangements and poor budgeting are some of the factors mitigating the development of the Libyan fisheries enormous potential. It is important to recognise that some keys to success require mainly public sector intervention, others only private, and some a mixture of both. Moreover, the fisheries sector needs private sector alliances at all stages of production to create competitiveness in this fish industry.

In general, the PDM shows that factor conditions are related to competitiveness and the diamond in Libyan context provides a useful basis for understanding factors of production dearth and opportunities to inform appropriate strategies and policy recommendations for fostering competitiveness. This chapter also shows on which factors of competitiveness Libya should put emphasis on or create to derive maximum benefits. Libya's coastline is a significant advantage to the related and supporting industries as access to components and machineries are in close proximity to Europe and the outside world. The development of fishing related and supporting industries encourages influx of firms and institutions to harness efficiencies and externalities across fishing industry. The next chapter deals with demand conditions of the diamond as it translates in the Libyan fishing sector.

Chapter Nine

Demand Conditions

Fresh Fish Demand in the Eastern Region of Libya

9.0 Introduction

The previous chapter has highlighted a number of factor conditions that act as a major barrier in fishing and fish production and marketing in Libya. There is poor infrastructure, and an unorganised logistics and marketing process. Weak policies and unstable institutions hinder the success of the industry. Moreover, post-harvest losses are high due to poor handling which hinders the value addition process. In this chapter, several factors affecting the demand function of fish and fishery products are analysed in line with Porter's diamond model demand conditions. On the one hand, the analysis of food demand is of great importance in food security policy, marketing decisions and economic development (e.g. Capps and Schmitz, 1991). On the other hand, the fish sector in Libya has potential contribution to make to the economy in terms of income generation, employment and protein production. This means the Libyan state, now more than ever, need to understand the nature of fish demand so as to be able to make adjustment and provide alternative policies to address the current food shortage. Despite the importance of fisheries sector to the Libyan economy outlined in various sections of this thesis (e.g. sections 1.5, 3.5.1; and chapter 4), the push and pull factors of the demand as well as the upward or downward changes along the demand curve are not well understood in Libya. The effects of price changes, income, distribution and accessibility, substitutes, tastes and other socio-economic variables on fish demand and consumers' expectations have not been researched.

Given the above, this chapter is structured to achieve objective of this thesis, which is to analyse and determine the prevailing domestic demand conditions affecting the ability of the fish industry to achieve competitive advantage, and to explore possibilities for exporting excess domestic fish supply. Porter (1998:86) argues that the "the most important influence of home demand on competitive advantage is ....the mix and character of the home buyer needs. The compositions of home demand shapes how firms perceive, interpret, and respond to buyer needs". In meeting the above objective, two research questions were addressed: 1) what are the factors that affect local fish demand in the eastern region of Libya; and 2) what are the barriers that prevent the

Libyan state from exporting fish to the neighbouring countries as well as the international market? Furthermore, this thesis adopts Shepherd's (1985) to present empirical evidences about fish consumption behaviour and tests their relationships (see section 5.3). In this sense and as far as the researcher's knowledge, this part of the thesis constitute the first attempt to use Shepherd model to extensively gather opinions and understand fish demand in Libya. According to Porter (1998:258), the demand condition is "perhaps the single, most powerful determinant of national competitive advantage". Figure 8.1 highlights demand conditions as the determinants of PDM that is dealt with in this chapter.

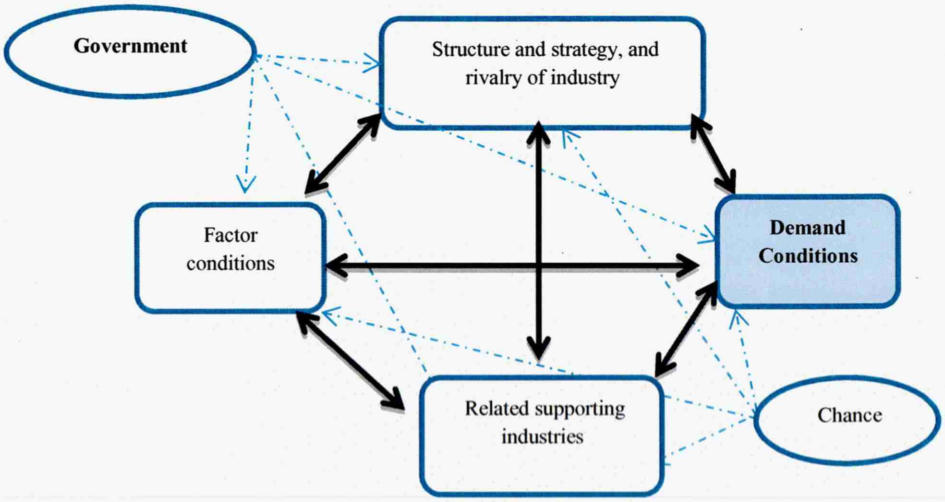
Government
Structure and strategy, and rivalry of industry
Factor conditions
Demand Conditions
Related supporting industries
Chance

Figure 9.1: Focus on Demand Conditions as part of PDM

The rest of this chapter is structured as follows. The next section describes the size of domestic fish demand in Libya. This section was drawn in line with Porter's (1998:86) argument that "three broad attributes of home demand are significant: the size and pattern of growth of home demand, the composition (or nature of buyer needs) of home demand, and the mechanisms by which a nation's domestic preferences are transmitted to foreign markets". Section 9.2 is devoted to the nature of buyer needs, including reasons for eating fish and factors influencing fresh fish consumption. Quantitative analysis of variables (such as factors affecting fish consumption) using Chi-square and logistic regression are contained in section 9.3. Section 9.4 is focused on the second part of the chapter, which is foreign trade of fish. In line with objective four of this thesis (to explore the features of the foreign trade of fishery), this section examines the possibilities for Libyan fish export from the present low-export capacity (see section 1.7.1). Finally, concluding remarks are outlined in section 9.5.

9.1 The Size of the Domestic Demand

This section deals with the analysis of the results of the size of the domestic demand in Libya in general, as well as the frequency of fish consumption in the study sample. There is little demand in Libya for fish, and the local market of fresh fish in the eastern region of Libya is small (for more details see chapter four). Fish catch including tuna, sardines, red mullet, salmon and sponges are popular but the demand is low. The findings of the present study were able to explore the reasons behind this. From the initial data available in the government reports, the local demand for fish ostensibly seems low. While the WHO recommends that the average consumption per capita should be 16 kg/year, fresh fish consumption in Libya was estimated at 6.4 kg per capita per year (Alaerg, 2007). Many factors account for this low demand and consumption level, not the least of which are associated with internal distribution. An attempt was made to identify some of these reasons in the following sections.

A) Frequency of Fresh Fish Consumption

The distribution of respondents as demonstrated by data analysis states that 90.3% of households consume fish while only 8.5% (n-34) households reported they do not eat fish. Out of 400 cases, 1.3 percent (n-5) cases were missing with no responses on their frequency of fish consumption. When respondents were asked how often they consume fish, the answers were once in a month, up to two times in a month, three to four times in a month and once in four months. There was no respondent who eats fish as frequently as one to two times in a week. Figure 9.2a indicates that people who eat fish once during four months make up the highest percentage 31.5% (n-126), followed by people who eat fish once a month representing 30.3% (n-121). Those who eat fish 1-2 times per month represent 19.2% (n-76) and those who eat fish 3-4 times per month or more represent 9.5%. The frequency of fish consumption is on 13 different fish species mostly consume in Libya (figure 9.2b). If the above sample of current demand and consumption level is placed against the diamond model's demand determinants, the current status of the size of fish demand in the local market seems far from the level of pressure that is required for generating competitive advantage in the fishing industry in Libya. Chapter six of this thesis and factor conditions in the previous chapter do reveal, however, that a better re-organisation, of Libyan fisheries, and the use modern methods and equipment for catching, as well as for handling and distributing the catch could motivate the industry to raise standard of fish supply that would increase demand.

Therefore, to achieve any increase in demand, we must understand people's consumption behaviour and buying habits and understand variables that influence fish consumption in further detail. Shepherd's (1985) model for food choice was chosen to achieve this aim.

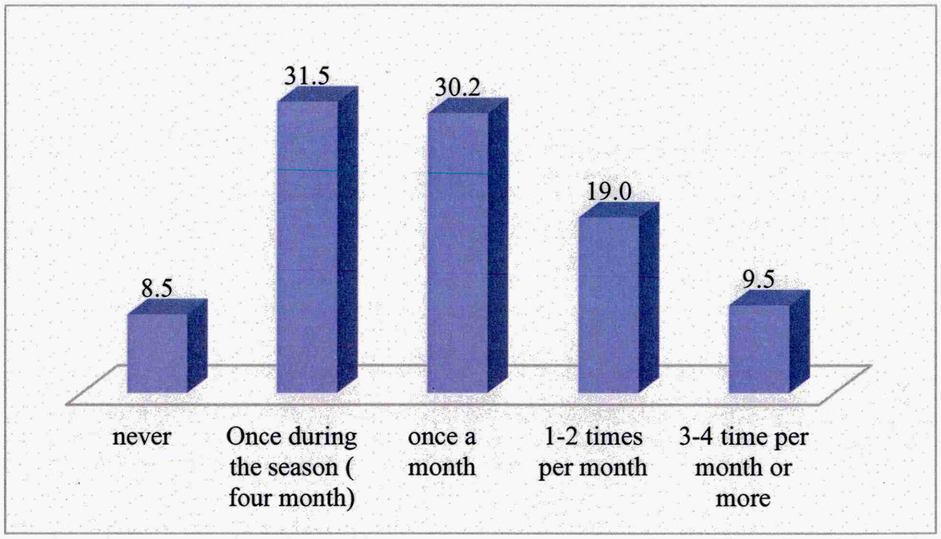

Figure 9.2: Distribution of respondents according to frequency of fresh fish consumption

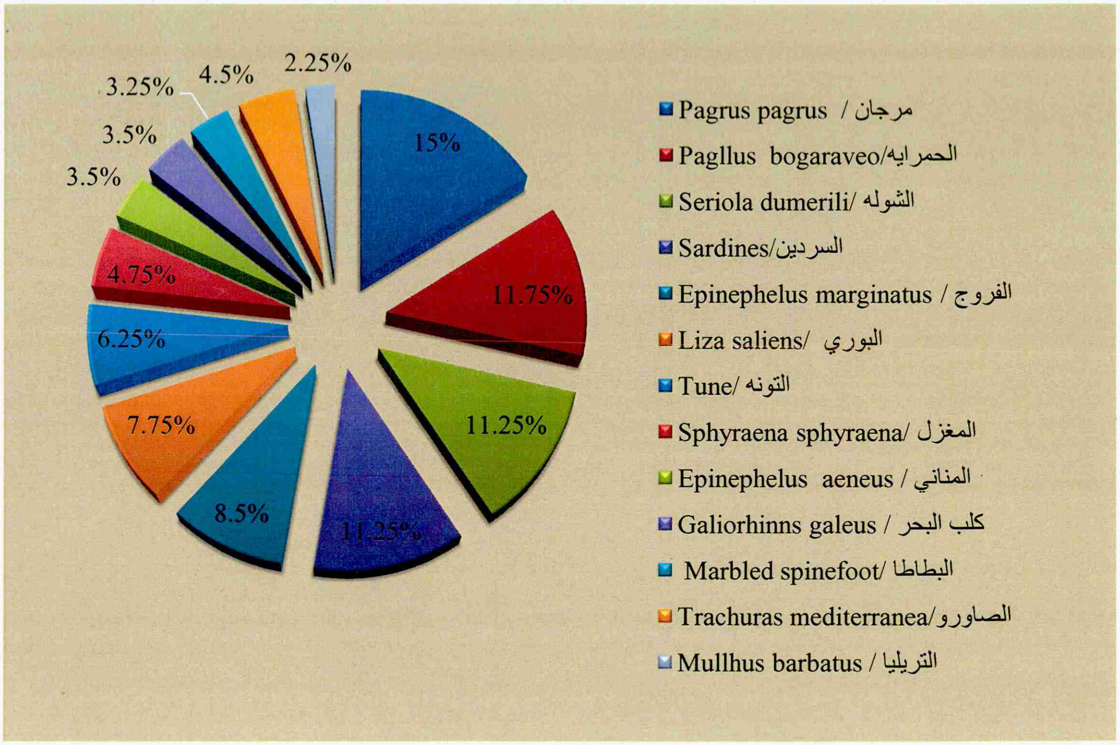

Figure 9.2b: Common fresh fish species consumed in Libya.
Source: Fieldwork 2011.

B) Consumption of Processed (Canned) Fish

Descriptive analysis showed that just above half of the respondents, representing 51% (n-204), consume tinned tuna. This result reflects a reality in the nature of the Libyan citizen who usually eats tinned tuna for breakfast or supper, especially in the summer. Thirty percent of the sample (n-120) usually eats tinned sardines while the proportion of households which consume tinned salmon was 8.5%. It was found that 10% of the consumers eat all three types of tinned fish (tuna, sardines and salmon). Only 0.5% cent (n-2) of them consumed other types but did not mention their preferred fish type (see figure 9.2 below). These results revealed that most of the canned seafood products are known by consumers and have also shown that canned fish is preferred over fresh, frozen and other type of fish products in Libya.

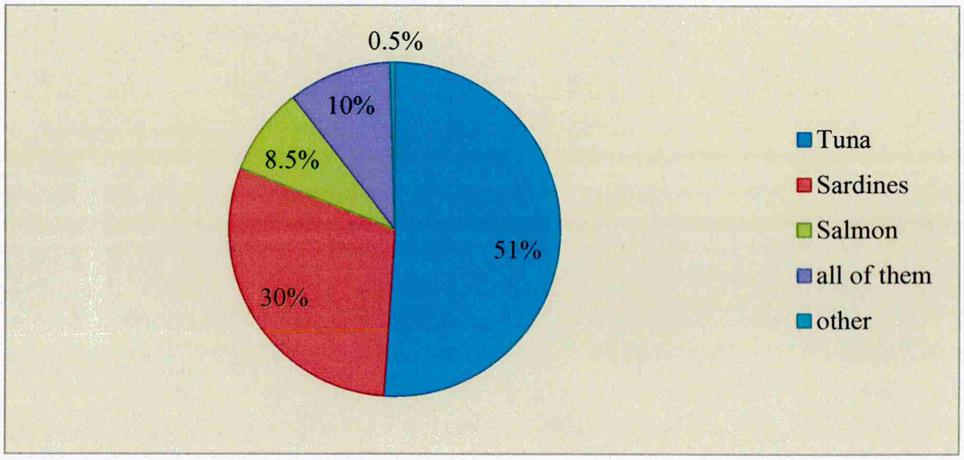

Figure 9.3: Distribution of respondents according to consumption of processed (tinned) fish

9.2 Nature of Buyer Needs

The quality of domestic demand structure is more important than the quantity (size) of home demand. From Porter's viewpoint (1998), the quality and nature of the consumer's needs is most important in influencing competitive advantage. To attain national competitive advantage, two characteristics of the composition of home demand are important; they are: sophisticated and anticipatory buyers. However, Porter claims that the size of the home market is only of secondary importance in achieving competitive advantage. This means that as the quality of supply improves, the greater the motivations to consumers to buy the product; and consequently any rise supply prompt production or catch increase to satisfy the market.

9.2.1 Reasons for not eating fresh fish

Because of the low demand for fish, participants were asked for the reason/reasons for not consuming fish. The data were originally divided into five categories (I do not like fish), (Not readily available) (Fish is not easy to prepare at home), (Fish is expensive compared with other proteins) and (Other reasons). However, after the consumers specified what other reasons they had, two categories emerged and were added, namely: (I do not like the aroma of fish) and (Fish has too many bones). Data revealed that only 34 subjects out of 400 households stated they have never consumed fish. 10 subjects out of the 34 declared that, the first reason for not eating fish was its high price. This was followed by the non-availability of fish for the consumer, forming nine subjects out of 34, while the proportion of consumers who 'do not like fish' came in third place (seven subjects out of the 34). The consumers whose answers were that 'fish is not easy to prepare at home' and those whose answers were 'I do not like the aroma of fish' were of equal percentage, representing three subjects out of the 34. Finally, only two subjects of the 34 avoided the consumption of fish because of its many bones. The above findings show that high prices and the distribution outlets which are not readily accessible to consumers are the obstacles most hindering the demand for fish. Issues to do with taste-preferences towards fish and preparation methods are known to be important predictors of fish consumption behaviour and demand. However, it was also determined that all non-consumers consider fish to be healthy.

9.2.2 Factors influencing fresh fish consumption

The literature review in section 5.3 showed that there are many factors that influence food choice, which include socio-economic, cultural, psychological and physiological factors. All of these factors interact with each other to form a consumer's final food choice decision. In light of Shepherd's model, six factors, which have an impact on fish consumption in the eastern region of Libya, are discussed. First, socially related factors (habits and culture) include: consumption of protein types as well as customs and traditions. The second factors relate to the individual, related to physiological effects and psychological factors which comprise: convenience of preparing fish meals, mood, health-related beliefs and experience. The third is the perception of sensory attributes, which comprise fish aroma and fish taste. Any shift in consumer's tastes may affect the shape of the fish demand curve. Fourth factors are related to food, which includes nutrient contents and quality of fish. Lastly, economic factors include prices and availability of places for selling fish. In this context, the time lags and distribution delays in fresh fish may affect availability and in particular when they are consumed fresh. All these factors are investigated in the study area as follows.

I) Social factors (habits and culture)

In this section, the sample is described in terms of social habits and cultural factors. These include consumption of fish, reasons for not eating fish, people's choice of a specific type of protein for their diets, their preference for a certain type of meat, the place where the city is located, consumption of processed (tinned) fish, and views about customs, traditions and culture. At the same time, this section also examines the relationships between previous variables and the fish intake by Chi square test.

a) Consumption of protein types

This question aims to determine the position of fish protein among other protein types in Libyan meals. Figure 9.4 shows that the highest proportions of consumers who usually eat chicken (145 families) represents 36%, followed by 139 families (representing 35% of the sample), who usually eat lamb. The number that consumes beef was 74 families, representing 19%. Occupying fourth place are people who usually eat fish, with only 30 families (representing seven per cent of the whole population). Ranking last from the sampled population, with only three per cent, are consumers who preferred to eat camel meat. The findings showed that the domestic market of other types of protein, either red meat or poultry is a strong competitor for the fish domestic market.

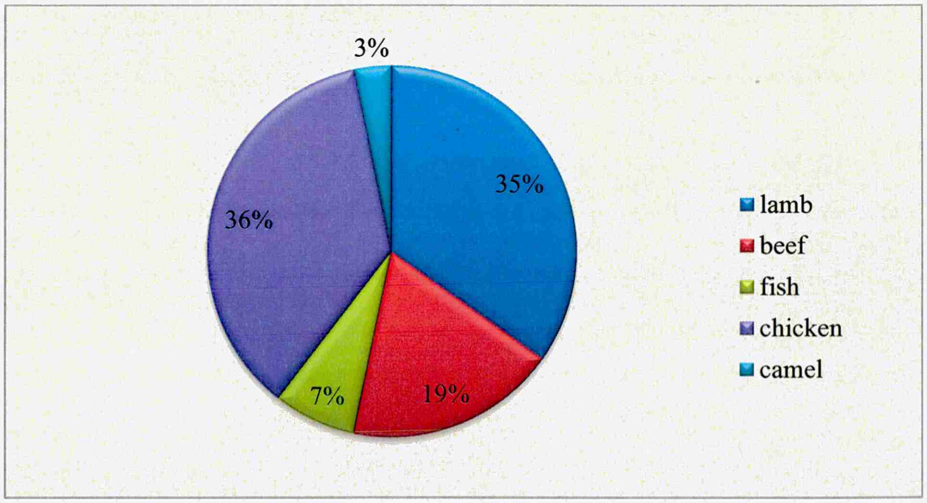

Figure 9.4: Distribution of the heads of households by consumed protein type.

b) Customs and traditions

To understand more about the impact of traditional Libyan habits of fish consumption, participants were asked about their preference for a certain type of protein. The majority of respondents confirm that Libyan people prefer a specific type of protein, 72% (n-288), while 27% (n-108) of the households in the city do not prefer any particular type of meat, and four of the respondents did not respond to this question. With regard to the type of protein they prefer, the distribution of households who consider that lamb is the most favoured in their city was 67%, from the sample across the four towns as shown in figure 9.5 below. This finding was not surprising because Libyan consumers usually prefer red meat, especially lamb, despite its high price compared to other types of meat. What is surprising is that fish came in second place, at 17%, which confirms the desire of consumers in Libya to consume fish. Those who preferred consuming beef constituted 11%; meanwhile only one per cent from the sample prefers to eat camel meat. The people in the city who preferred other types of meat represent four per cent.

The results indicate that lamb is the most popular amongst the chosen sample across the four cities. Interestingly, the highest proportion of the sample, 36% (as shown in figure 9.4 above), said they eat chicken; however, when asked what kind of meat they thought people in their city preferred, they said that the percentage who preferred chicken was zero. This shows that people's preferences may not necessarily be the same as what they actually buy and consume.

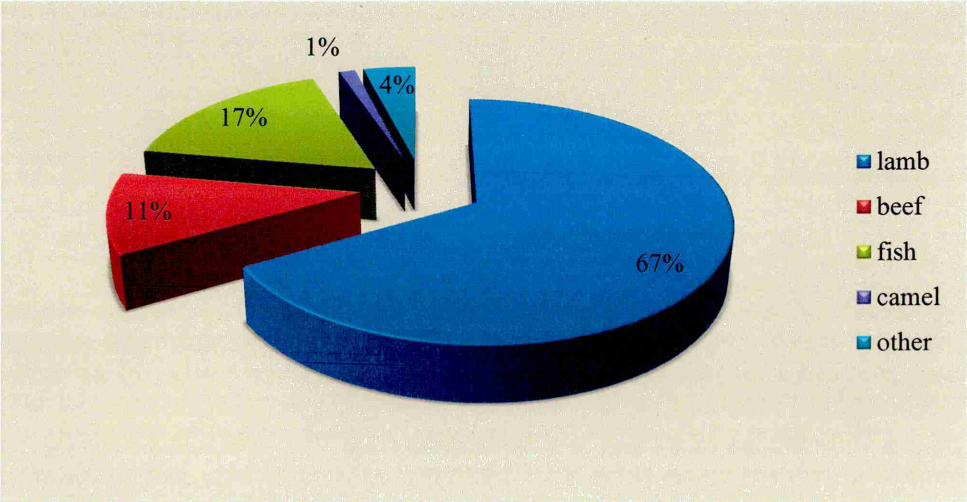

Figure 9.5: Distribution of the heads of households by preferred protein type.

The findings indicate that perceptions of the consumer about their local customs and traditions have an impact on food preferences. In some tribes there is a cultural perspective on fish-eating, where fish is not considered a main meal. A number of heads of households believe that a fish dish cannot be considered a main meal. For example, participant 20 opined that:

> Fish is not considered as a main meal (lunch or dinner).

Because fish is not acknowledged to be a meal, it will not be offered to a guest as a main meal, and for some it might be considered a mark of disrespect. This cultural element was confirmed by many of the respondents; lamb was regarded to be the most appropriate food to serve an appreciated guest. Fish could be served, but only if accompanied by red meat. For example, 50% of households believe that a fish meal should not be served to guests according to their family values and traditions i.e. it is not part of Libyan culture. For example respondent 253 said:

> The norm in society is that there is no meat better than lamb and is disrespecting to serve just fish to a guest.

However, a large proportion, representing 48.5%, did not see any cultural barriers that prevent them from serving a guest fish. Those who did not respond represent 1.5%.

II) Factors related to the individual

In this section, the sample is described in terms of physiological and psychological factors.

a) Physiological effects

Some respondents pointed out that fish consumption has a physiological effect. Participant (324) said that:

> Eating fish makes you thirsty, especially in the summer.

In addition, consumers have commented that a fish meal is not a main meal and that they do not feel as full or satisfied as they do when consuming other meals.

b) Psychological factors

Psychological factors dealt with distribution of respondents in relation to the effect of convenience of fish meal preparation, human mood, health-related beliefs and experience on fish consumption.

1- Convenience (preparing fish meals) and frequency of fish consumption

On the distribution of respondents according to the convenience of preparing fish meals, the findings suggest that those who thought that preparing fish meals is easy constitute 40%. The households which consider that fish meals are not easy to prepare represent 58% of the sample. Meanwhile, out of the 400 cases, two per cent (n-8) of the households provided no response. The purpose of this question is to explore if the convenience of preparing fish meals has an impact on frequency of fish consumption. Convenience has many meanings but in this research it is used to mean the ease or difficulty of preparing the fish meal. The views about preparation of fish meals showed that some of the heads of households believe that the process of preparing and cooking a fish meal is not easy, troublesome and it takes a lot more time compared with other types of protein. Some of them also claimed that cleaning fish is not easy. For example, participant 398 said:

> The method of preparation of fish requires time and effort; therefore, consumers usually buy fish sometimes once a month.

According to the views of some participants in the sample, this is an obstacle that keeps fish off the table of the Libyan citizens unlike other types of proteins: thus fish is rarely bought. In addition, some housewives do not know how to prepare a fish meal in a good way. For example, participant 305 reports:

> There is the inability of some housewives to prepare a fish meal. It is not easy to prepare at home.

Some of the consumers believe about the time, effort and know-how needed for the preparation of fish meals might explain the avoidance of fish preparation by housewives. From the viewpoint of the respondents, this problem needs to be addressed and preparation of fish meals made easier. They recommended a need for cookery books that details simple step-by-step preparation of fish to help housewives master this skill. For example, participant 38 said:

> The media should focus on helping families prepare fish meals.

The phenomena of women going to work outside the home in recent decades may well be an additional factor in this reluctance to prepare meals involving fish. In addition, some heads of household referred to the need to create and train workers in restaurants to prepare different fish dishes. This might encourage people to discover different fish dishes and attempt to cook them at home. The other possible ways to increase consumption is through selling fish in ready to cook package for those who do not like the fresh one and/or are not prepared to go through the hassle of preparation.

2- Mood and frequency of fish consumption

The distribution of respondents according to whether they believe that eating fish helps one cope with stress is presented in table 9.1.The majority of respondents, representing 70%, did not believe that eating fish helps cope with stress or modify the temperament, suggesting that there is no relationship between moods and selecting fish. Those who believe that fish consumption helps one cope with stress represent 30% of the population.

Table 9.1: Distribution of respondents according to effect on mood

Does eating fish help cope with stress?	Frequency	Per cent (%)
Yes	118	30
No	281	70
Total	399	100

Source: Author’s own analysis

3- Health-related beliefs

A considerable proportion of respondents stated that they consume fish, and they agreed that fish products are beneficial for health. The prevailing belief that eating fish has a positive impact on human health significantly affected the decision of the head of the family. Results showed fair understanding that eating fish maintains good health and their reasons for fish consumption were primarily related to health (see IVa). Conversely, an interesting result emerged where they either did not agree or do not believe that there is a strong positive relationship between eating fish and being healthy (see, appendix IV). Most of the respondents strongly hold the conviction that eating fish is healthy and nutritious, and that consuming fish consistently protects the body from disease, as fish contains many vitamins. For example, among these respondents, some were aware of low amount of cholesterol (49%), digestibility (54%) and high content of fatty acids (22%) of fish. Almost half of the respondents know fish as a good source of vitamins (such as vitamin D), minerals and protein. Fish also contains amino acids, which has not been noticed by any of the respondents. Section IVa contains some of the reasons for participants little or no understanding of the nutritional value of fish. Meanwhile, participant 261 opinion about the health benefit of fish was that:

> Fish has many nutritional benefits and protects you from high blood pressure and other diseases.

One participant (219) claimed:

> If people with thyroid disease ate fish weekly, it would help them. Fish would also help people with liver problems, as would fish oil tablets, these are good for the hair and body in general, too.

As well as that, some heads of household have a conviction that eating fish increases the vital energy in the body. Other consumers consider that fish is also useful for psychological health; participant 214 suggested that:

> There should be awareness of the importance of fish for physical and psychological health and mental well-being.

On the other hand, some believe that eating fish may be the cause of certain diseases. Participant 324 added:

> It may cause skin allergies in some people.

4- Experience

The results of the analysis showed that people's experience with food affects the choice of the type of food they eat throughout their lives. For example participant 134 gave another dimension to this customary or superstitious belief:

> I have the psychic knots from childhood because of fish bones.

In addition, the views expressed above show that the high presence of bones in fish causes concern and fear of eating it, especially in families with children. For example, participant 73 does not cook fish because:

> I am frightened of giving children fish because of the bones. It is difficult for children to eat fish because it has so many bones.

III) Perception of sensory attributes

The results of the analysis showed that there are some perceptions of sensory attributes that affect fish consumption; they are aroma and taste.

a) Fish aroma

Fishy odour or aroma is another important reason why some consumers (38%) avoid purchasing fish or eating it, but some (12%) would consider consuming fish that do not have fishy aroma. If the aroma of fish is not acceptable to any member in the family, this might prevent the head of the household from purchasing fish altogether. Participant 156 does not like fish aroma:

> The smell of fish is not acceptable for some members of the family and this is an obstacle to purchasing fish.

In addition, one of the reasons for the scarcity of fish in the Libyan diet is the odour of fish, which is not acceptable, as upheld by participant 78:

> The frequency of eating fish is low, because of the smell.

b) Fish taste

Taste is believed to be another sensory attribute that influences the choice of consumers in purchasing and eating fish. The result showed that 64% of consumers believed that the taste of fish is a very important factor which affects the purchasing of fish for home consumption. The importance of taste also has an influence on the decision of the head of the family to purchase fish for his family.

IV) Factors related to food

a) Nutritional content

Figure 9.6 indicates that 71.8% (n-287) of the population had no knowledge about the nutritional value of fish while only 109 consumers, representing 27.3% of the sample, have knowledge about the nutritional value of fish. Out of 400 cases, one per cent (n-4) of the cases were missing and do not form part of this analysis.

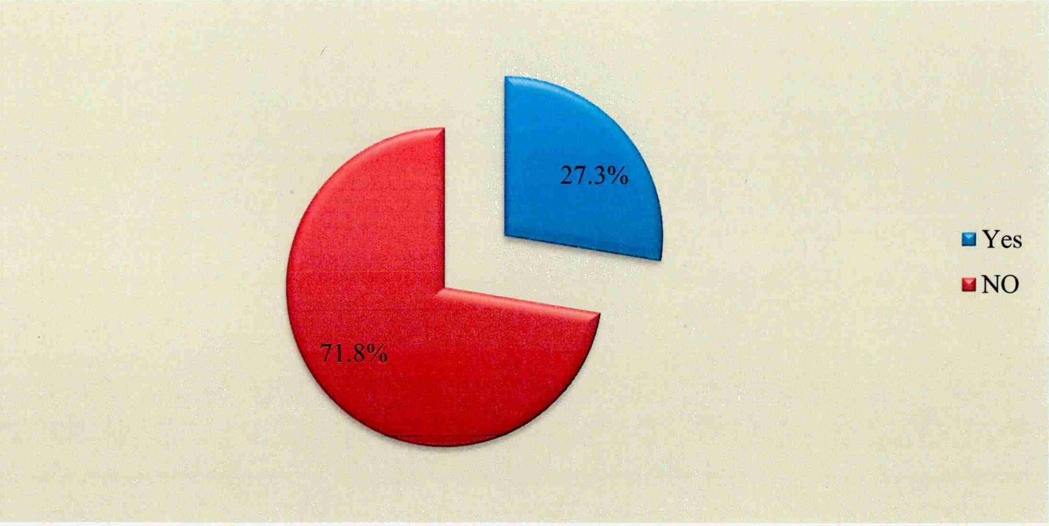

Figure 9.6: Distribution of respondents by knowledge of the nutritional value of fresh fish

Regarding the perception of consumers about the nutritional value of fish, some respondents stated that Libyan consumers often do not pay attention to the nutritional value of food during their food choice. For example, participant 328, in his answer about the obstacles that prevent people having a meal of fish in Libya said:

> I think the public awareness of the citizens does not give the nutritional value of food any importance; the quality of food and its usefulness which is recommended by doctors or researchers is disregarded. They just want to eat a meal that fills their stomachs and satisfies them.

Most of the respondents said that a lack of awareness about the value of fish and the importance of protein found in fish is also a factor that made the fish meal an uncommon feature in Libyan society, despite the length of the Libyan coast. For example, participant 119 blames this on lack of awareness:

> There is a lack of sufficient awareness on the nutritional value of fish. Who is responsible for Libyans to know the importance of eating our fish? I think private individuals and radio houses should come in to create the awareness.

While some of the interviewees believed that there is no meat better than the national lamb and mutton, others believe that mutton, beef and poultry meat have more nutritional benefits than fish. In this regard, Participant 170 commented that:

> They believe that a meal of meat and chicken are more useful, palatable and common. It is what we know and are accustomed to since childhood.

In support of the comment made by Participant 11 about awareness, other interview participants (such as 110, 324, 79, 359) believed that the media play a strong role in promoting and changing habits of consumption and increased frequency of eating fish in the Libyan diet. Most of the respondents' suggestions in this aspect revolve around raising awareness among consumers about the nutritional value of fish. For example participant 359 said:

> I think that the culture and awareness about the value of fish food will be useful to in increasing the frequency of fish consumption.

Respondents' suggestions about the way and means of raising awareness of the importance of fish protein varied. For example, participant 110 proposed:

> We should highlight the role of the media and the press in the definition of the value of consumption of fish.

In addition, one suggestion, among others, was that the Department of Health should hold awareness and sensitisation sessions and workshops about the importance of eating fish and clarify the importance of the nutritional value of fish for the human body and national well-being. Moreover, they should design scientific publications to show the importance of fish consumption and its effects on the productive ability of individuals who consume fish to national development. The distribution of educational brochures about the importance of the type of protein found in fish could motivate citizens to consume fish more frequently. Participant 28 suggests that:

> People should be educated about the nutritional value of fish by means of posters and awareness programmes.

Meanwhile, some participants confirmed that publicity and the promotion of fish consumption, with a focus on the health aspect, will help ensure that in the future this food will become part of the popular diet in Libyan society. Moreover, some participants also saw a need for the importance of fish in be included in the school curriculum as well as on TV shows in order to raise awareness among citizens about the importance of fish for health, especially for children, pregnant women and the elderly. There is a need to educate housewives not only about cooking and preparing different fish dishes but also of the importance of the nutritional value of fish. For example, participant 149 proposed that:

> Housewives should be educated through special seminars and cooking videos that raise awareness through the media about the importance of this food.

b) Quality of fish

Some consumers mentioned that the fish available in the local market is not of good quality, and this may be one of the reasons that prevent consumers from purchasing fish. For example participant 79 suggests:

> The lack of good supply of fresh fish quality fish is sometimes what prevents people from buying and eating it.

There were multiple views from some participants about the quality of fish available in the domestic market, including non-availability of fish that are of good quality and poor quality of fish species that are available in the market. Participants thought that these reasons may explain the absence fish in the Libyan diet. In fact participant 79 believes that the price of fish is not as important factor affecting fish consumption as compared with the quality at the market.

V) Economic factors

a) Price

Figure 9.7 shows the consumers who believed that fish prices are not appropriate for their income form the highest proportion of the population, 65% (n-260). Meanwhile, 34.2% (n-137) from the sample population believed that the price of fish is suited to their salaries. Out of 400 cases, 0.8% (n-3) of the cases were missing and do not form part of this analysis.

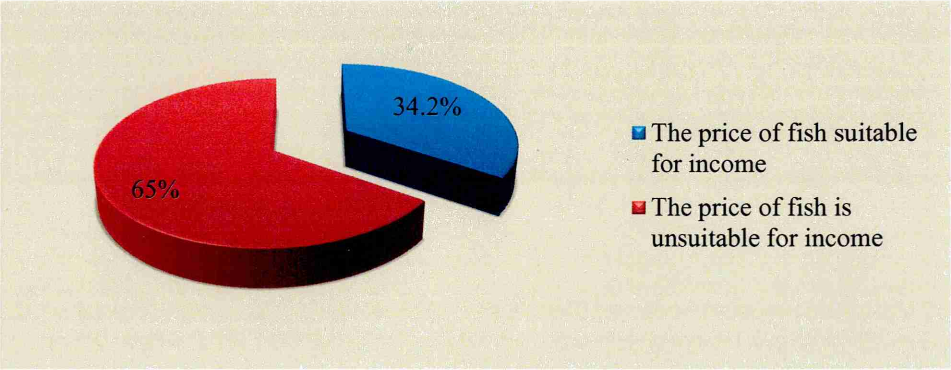

Figure 9.7: Distribution of respondents by affordability by consumer.

With regard to the consumer's perception of price, results in the current study show that fish is expensive for many of the study's participants. It is believed that price forms the main obstacle preventing the Libyan consumer from taking advantage of fish protein, despite its nutritional value. Therefore, fish price is one of the impediments that keep this important protein out of the Libyan kitchen, especially the high price of good fish species. Many consumers have the desire to buy fish, but high prices prevent them because the price is not suitable for the average citizen. Many participants confirmed that there are no barriers with the exception of price and that a meal of fish is usually more expensive than other meals; however, if the price was lower, fish consumption frequency might become a weekly or even daily meal. Based on these results, one can postulate that there is a link between income (ability to pay for the value of fish) and consumption frequency of fish - when income rises, people can purchase more fish.

In addition, heads of households noted that fish is more expensive than others type of protein, such as chicken, and that therefore people prefer to buy chicken to save money. Heads of households also have a conviction that the government does not control the price of fish; therefore, the price has become too high and not suitable for a large segment of consumers. Furthermore, the price varies from town to town and from one vendor to another. Therefore, each dealer sets prices arbitrarily, without restrictions or limits. There are laws that regulate and determine the sales price of fish, but they are not applied, which are the reason for the fluctuation of prices and this places the consumer at the mercy of the seller. Hence, the consumer turns to cheaper alternatives such as chicken and beef, which are constantly available and found everywhere in the city. On Participant 290 account:

> The obstacle that prevents a meal of fish from being important is the rise in price of a kilogram of fish as well as fish that are rarely available in the market.

The following is an example of the pre-crisis prices of Mutton, Beef and Chicken. The prices are fluctuating and far above the pre-crisis prices. The price of chicken has gone up to 3LYD per kg at the peak of the conflict in 2012. Because poultry feeds are imported and the import that was restricted due to the crisis caused dwindling chicken feed supplies, driving up prices that makes some poultry farmers ran out of business and consumers not able to afford their favourite animal protein.

- Mutton: Kilogram of Mutton = in 2010 the price is LYD 12-16 per kg; in 2015, it is sold for around LYD 20-25 per kg in the market.
- Beef: Kilogram of Beef = in 2010 the price is LYD 8-10 per kg, however, in 2015 it is sold for around 12-18 LYD per kg in the market.
- Chicken: Kilogram of Chicken = in 2010 1.750 the price is LYD per kg. In 2015, it is sold for around 3LYD.

The price of the different varieties of fish indicated in table 9.2 shows the disparity between the price of some types of fish and other types of animal protein mentioned above. It is clear from the table that pre-crisis high prices of fish may be an important factor in driving consumers to chicken, mutton or beef. Sardines, which is the cheapest of fish species, is a more expensive than the initial pre-crisis price of chicken and a lot smaller in quantity. If the prices continue to be much higher than that of other muscle foods, fish eaters are most likely going to reduce their frequency and quantity of fish consumption.

Table 9.2: prices of fish species in Libyan fish markets

Type of fish	price/ kg / LYD (9-12) 2011
الحمراية /Pagllus bogaraveo	11- 14
القاجوج --	15
صورو /Trachuras mediterranea	10
فروج /Epinephelus Marginatus	7-10
مناني /Epinephelus Aeneus	7
الشوله /Seriola dumerili	8-12
المرجان/Pagrus pagrus	12-10
الصاورو/ Trachuras mediterranea	10
تريليا / Mullus barbatus L	12-12
سيبيا - Sepia officinalis	5-9
السردين / Sardines	2 - 2.15

Source: Study's Field work

Six heads of households have proffered some suggestions on how to make a fish meal more common in the Libyan diet. The most important of their proposals is to solve the problem of high prices by the government. Five of the participants demand that the state control and fix prices and develop a pricing system for different types of fish. Moreover, the government should apply laws relating to price control firmly to help ordinary citizens obtain this important protein. Others commented that lowering the price of fish would help the head of the family to obtain this important food for his family and it would thus appear more frequently in the Libyan diet. The following was the view of participant 90:

> From my point of view, in order for a meal of fish to be a common meal, prices must be reduced to become suitable for low-income citizens and for all income levels.

b) Availability of places for selling fish

The distribution of respondents according to availability of fish to consumers in the eastern region shows that 61% find it difficult to obtain fish because it is not available on a regular basis in the markets. Consumers who believed that they can get fish easily due to its availability constitute 38.5% of the population under examination, while 0.5% of the households provided no response. In relation to consumer perception about the availability of places for selling fish, half of the respondents mentioned that one of the obstacles preventing fish meals from being part of the Libyan national's diet is inadequate fish sale outlets in many cities. These usually exist in one place or in places far from residential neighbourhoods; most of the vendors are found in places near the coast. Fish is not available at all times; just at limited times. This tends to be another reason for increases in the price of fish. Also, half of the participants pointed that there is an insufficient supply of quantities of fish and a shortage in diversity in the existing species of available fish. The following frustration was expressed by participant 288:

> Fish is not sufficiently available in shops. It is not available in various places; usually in one place in the city and also it is not available in restaurants. The price of fish is high and it is more expensive than what we see in other cities.

The field study results showed that many of participants indicated that there are not any shops for selling fish in many inland villages and non-coastal cities. In the city of Shahhat, there is no static port for the sale of fish, although it is only 25 km away from the sea. Vans selling fish travel from the place to place, usually on Sundays, and they do not stay long on that day. For example, participant 356 emphasised that:

> There are no markets to sell fish in the city of Shahhat.

In addition, the constant availability of various types of meat makes consumers prefer to buy other types of animal protein. Most of the households prefer to buy chicken, lamb, beef and other types of meat which are easy to access. For example, participant 210 reckoned:

> The obstacles that prevent fish from being an important meal in Libyan society exist because red meat and poultry are plentiful and available permanently.

This participant and several other respondents expressed the opinion that fresh fish is not daily available in the markets and it is believed that freezing fish leads to loss in nutritional value and health as assumed by participant 129:

> There is no structured mechanism for the marketing of fresh fish in the towns and villages. If the fish is frozen for a long time, it may lose some tastes or nutrients.

The respondents indicated that there are not any niche markets for the sale of fish in some cities. This means the shops that sell fish are found in just one specific area. The quality of places selling fish fall below the level of acceptable standards and the markets are not suitable for fish display as fish is a very sensitive and perishable commodity. For example, participant 35 supposes that:

> There is a shortage of specialised fish markets in terms of places and means of display.

Fish requires special treatment from the moment caught by the fisherman until it is delivered to the consumer. However, many of the heads of households pointed out that there are deficiencies in the refrigerated vehicles carrying fish to the markets. In addition, some of the participants pointed to the shortage of vehicles which keep fish fresh, resulting in fish that is not good for consumption. Some of the participants (e.g. 69 and 35) mentioned that the method of display is primitive and disorganised and that marketing methods are not healthy which means that fish could be damaged. Regarding fish handling in the market, it was mentioned that there is poor handling of this sensitive commodity. The markets available do not provide a healthy environment appropriate for fish. Many of the heads of households have stressed that some traders display fish in the outlets which are exposed to dust and sunlight and other factors that might affect the quality of fish causing damage and loss of nutritional value. For instance, participant 305 stated that:

> In terms of being exposed to environmental factors, there are stalls selling fish without cover and therefore it is prone to dust.

Photographs taken in the field study by the researcher demonstrate the conditions of some fish stalls and shops as described by some of the study's participants (see Photos 1, 2, 3 below). Figure 8.8 exemplifies this condition.

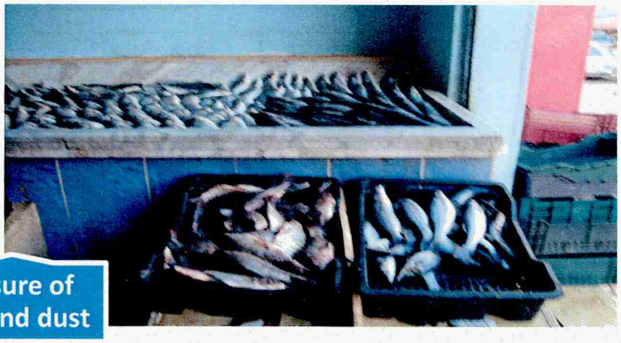

Photo 1: Exposure of fish to the sun and dust

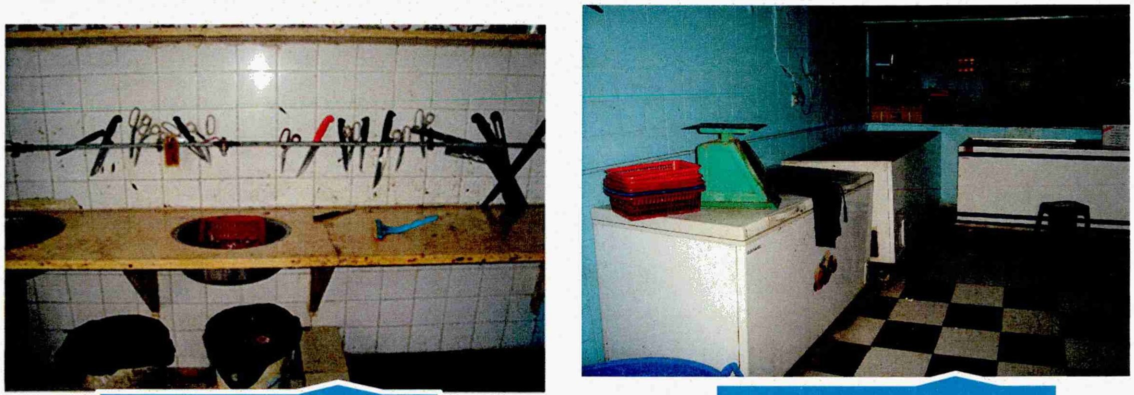

Photo 2: lack of hygiene in stores

Photo 3: lack of hygiene in stores

Figure 9.8: Images showing lack of hygiene in shops selling fish.

As indicated in Photo 2 and 3, Participant 305 also lamented that the dirty, stinky and filthy state of some shops selling fish is enough to discourage one from buying fish. From the view of the participants, there is a lack of modern fish markets supplying fish in the right places, with the appropriate prices and at times suitable for the consumer. There is the absence of specialised fish markets in clean places with appropriate ways of display and quality control in fish - all this reflects the absence of market organisation for fish. For example, participant 380 commented:

> From my point of view the lack of orderly markets and price control is one of the obstacles preventing the meal of fish from being important in Libyan society.

The second question to the participants was about suggestions that may help to introduce this type of protein into the Libyan diet. Many participants suggested that increasing points of sale of fish will solve the problem of limited availability of fish in the cities. For example, participant 277 suggested that:

> There should be a spread of distribution centres outside the coastal strip.

Participants 277 and 178 also suggested that there is need for a greater increase in fish shop numbers in residential neighbourhoods. For example, participant 178 recommends:

> The fish shops that sell fresh fish should be near the residential areas. Also, they should sell fish in the appropriate places and far from roads and open spaces.

Respondents called for establishing markets for the marketing of fish in each city and this marketing should be specialised. Also, adequate transportation and the delivery of fish should be daily. Participant 285 would prefer:

> The provision of integrated markets with means of transport and refrigerators is necessary.

Traders should ensure that fresh fish is available to consumers in different parts of every city especially the non-coastal cities that do not overlook the sea. This would encourage consumers to buy this type of protein.

Fish should be available in quantities and at suitable prices for citizens to encourage the consumer to buy. Moreover, many heads of families suggested that there is a need to establish restaurants that offer fish meals at affordable prices in all the cities of the region in order to help Libyan people to get accustomed to eating fish, and also to provide all types of fish on the market, whether fresh or frozen. To make fish widely available and more accessible to the consumer, some heads of families suggested that there is a need to provide fish in the butchers' shops that usually sells all kinds of meat (lamb - beef - goat - chicken - camel) with the exception of fish. Many respondents mentioned that the presence of fish in these types of shops, which are widespread all over the cities, would lead to fish consumption in the Libyan diet, like other types of meat. Participant 310 was hopeful when he stated in this manner:

> I wish that fish was available in the markets, butcher shops, in hospitals for patients and staff, at schools for students and staff, as it has an important nutritional element. In addition, Libyan people should eat a fish meal per day because it is very useful for the body, whether grilled, fried or poached, and it is excellent value, too.

In addition, participants mentioned other countries which benefit from fish and they wished that the Libyan people could imitate neighbouring countries. For example, participant 380 has drawn instances where countries locally consume and derive benefits from their fish resources:

> We should encourage the establishment of fish restaurants in Libya similar to what exists in Egypt, because Libya has very good fish species.

The above sections have shown the various factors that account for low fish demand in Libya. The section that follows is a statistical analysis of the responses made so far to draw relationship between two or more categorical variables.

9.3 Quantitative Analysis of Variables

In this section, two methods were analysed in order to get statistical results and to establish any relationship between the factors affecting fish consumption in Libya. These two methods are Chi—square test (9.3.1) and logistic regression analysis (9.3.2).

9.3.1 Chi-squared test, factors affecting fish consumption

The Chi-square test was used to examine the association between some of the factors affecting fish consumption (see also section 7.7) which are mentioned in this section, and the frequency of fish consumption in the section on the quantitative analysis of variables. The purpose of using Chi-squared test (≤ 0.05) and specifically the bivariate analysis is to, first, test the hypotheses and determine the empirical relationship between the dependent variable (DV) and the independent variables in order to select variables used to develop a logistic regression model in the next section (see Appendix K for the details of Chi-square results of the factors that are statistically significant, which are family size, family income, cities, preparing fish meals and health-related beliefs). Results of the test are shown in table 9.3.

It appears from table 9.5 below that the result of the Chi test indicated that on the whole, the relationship between family income per month and the frequency of fish consumption can be considered as the strongest compared with the other variables that entered the test. The test of significance showed that $P= 0.0001$ and Cramer's V= 0.260 (see Appendix K for the details). This suggests a moderate association between family income per month and the number of times fish is eaten. The analysis showed that fish prices are very high compared with other forms of protein. The correlation between consumption and cost can be seen in the finding that 47% of households who consume fish frequently during the month belong to the highest income groups. This finding is supported by other research studies investigating the relationship between frequency of fish consumption and income, including Wan and Wuyang (2012), Verbeke and Vackier (2005), Manrique and Jensen (2001), and Jensen and Manrique (1998). However, this finding contradicts studies whose findings revealed that income has no direct role or just appears to play a role in explaining the frequency of seafood purchases (Herrmann et al., 1994; Myrlanda, 2000).

Table 9.3: Summary of findings about factors affecting fish consumption using Chi-Square Test

Dependent variable	Independent variables	The relationship between Independent variables and Frequency of fish consumption /Chi-Square test	
		P-Value	Cramer's V
Frequency of fish consumption	Age	*P* = .018	V=0.143
	Gender	*P* = .810	V=0. 064
	Education	*P* = .057	V= 0.128
	Family Size	*P* = .0001	V= 0.175
	Number of children	*P* = .953	V=0.066
	Family income	*P* = .0001	V= 0.260
	Cities	*P* = .0001	V=0.186
	City's location	*P* = 0.790	V=0.066
	Knowledge of the nutritional value of fish	*P* =0.751	V= 0. 070
	preparing fish meals	*P* = .0001	V= 0. 246
	Health- Related beliefs	*P* = .005	V= 0. 194

Source: Author's own analysis

Convenience (preparing fish meal) came second as the most important factor affecting fish demand. The chi-square test showed that *P*= 0.0001 and Cramer's V= 0.246, suggesting a moderate association between the frequency of fish consumption and convenience (preparing fish meal). The findings show that some individuals are averse to consuming fish because of a perceived difficulty in preparing fish and fish dishes. This supports findings of a relationship between fish consumption and ease of preparation in research conducted by Thi Xuan (2007), Wessells et al. (1996). Some heads of households explained that fish and fish dishes are not easy to prepare compared with other proteins, such as meat. The preparation of fish requires time and effort; thus, fish is rarely bought. Indeed, the phenomena of women going to work outside their homes in recent decades may be a factor contributing to their reluctance to prepare meals involving fish. In Libya, women are responsible for cooking at home as well as taking care of the children. With work outside home and house chores further compounds their schedules - this might lead them to avoid meals that require too much time and effort to prepare.

As for family size, the Chi-square test revealed that $p<0.01$, Cramer's V=0.175 suggesting a moderate association between family size and frequency of fish consumption. Furthermore, the findings of this research demonstrate that beliefs related to health have a positive impact on the frequency of fish consumption. The heads of those families who eat fish between 3-4 times a month are mostly confident that fish has health benefits, and it is statistically significant as revealed by the tests (P= 0.005 and Cramer's V=0.194) (see Appendix L for details).

The behaviour of consumers also varies significantly; it differs with respect to the city in which they live; whether in the eastern region of Libya or elsewhere. The Chi-square test revealed that *P*= .0001 and Cramer's V=0.186. This indicates an association between the frequency of fish consumption and the different cities consumers inhabit; statistically, it is significant (see Appendix K for details).

The age of the heads of households was also examined in relation to the frequency of fish consumption. The result of Chi-square test showed that the correlation between the age of the head of household and the frequency of fish consumption was statistically significant (*P*= 0.018 and Cramer's V=0.143). Therefore, the age of the head of the household is one of the factors that explain the frequency of fish consumption. The current study shows that the youngest group members, who are under 25 years of age, are less likely to eat fish. Therefore it is possible to posit that fish consumption increases depending on the age of the household head and the frequency of consumption is more common in older age groups.

The data analysis by Chi-squared test also revealed other variables such as the level of education, the gender of the head of household, the location of the city and the head of the household's knowledge about the nutritional value of fish - statistically these are not significant, though they have a positive impact on fish intake. For example, gender is not a factor that affects fish consumption in Libya.

9.3.2 Results of Logistic Regression Analysis

Table 9.3 above shows that age, family size, family income, cities, methods of preparing fish meals and health-related belief can determine the frequency of fish consumption. These variables were further examined to predict how they affect the frequency of fish consumption in the eastern region of Libya. Table 9.4 below defines the binary outcome (dependent variable). The model focuses on the category 'eat fish more than once a month' which is coded as '1'. Independent variables and the dummy variables have been created as follows: the age of the head of the family has in turn another four dummy variables; the name of the city has four dummy variables; family income has three dummy variables while preparing fish meals and promoting belief in the healthiness of fish have two each. The reference groups for each explanatory variable are as follows: 46-60 for age of the head of the family, 7-8 persons for family size, Benghazi, for naming a city; the family income is 600 D or less; "no" is for both preparing fish meals and health-related beliefs.

Table 9.4: Dependent variable encoding: do you eat fish?

Original Value	Internal Value
No	0
Yes	1

Source: Author's own analysis

I) Interpretation of the model

Table 9.5 shows the case processing summary; it indicates that combined missing values from the outcomes and the explanatory variables reduce the sample from 400 to 387. Therefore, there is data on all variables for the 387 respondents.

Table 9.5: Case processing summary

Case Processing	N	Percent
Included in Analysis	387	96.8
Missing Cases	13	3.3
Total	400	100.0

Source: Author's own analysis

The full model was statistically significant; p <.000 and it explains 39.7% of variation on fish consumption. The Chi-square value of the model is 14.455. The variation in the total age of the head of the family, family size, name of the city, family income, fish meal and healthy belief, and preparing fish meals account for between 24% (Cox and Snell R^2) and 34% (Negelkerke R^2) of the variation in the frequency of fish consumption in the eastern region of Libya. Using the model, the result of analysis also shows that 80.9% of respondents can be correctly classified. Table 9.6 shows the coefficient of logistic regression and odds ratio for each of the six predictors. The results of the analysis indicated that there are five variables affecting frequency of fish consumption. The statistically significant variables are: age of the head of the family (p

= .005), family size (p = 0.001), city (p = 0.000), family income (p = 0.000), fish meal easy to prepare (p = 0.0001).

Table 9.6: Result of Logistic Regression Model

Variables		B	p	Exp (B)
age	under 25 years		.005	
	26-45	.142	.824	1.153
	46-60	-1.143	.000	.319
	61+	-.358	.322	.699
Family Size	1-4 Person		.001	
	5-6 Person	.990	.010	2.691
	7-8 Person	1.270	.001	3.561
	Over 8	.084	.821	1.088
Family's Income	600 D or less		.000	
	601-900 D	.746	..020	2.109
	901 or more D	1.665	.000	5.285
City	Benghazi		.000	
	Albeida	.128	.741	1.136
	Shait	.699	.309	2.013
	Tobruk	2.253	.000	9.514
Fish meal easy to prepare	yes	1.065	.000	2.900
Health-Related Beliefs	yes	-.305	.361	.737
	Constant	-2.268	.000	.104

Source: Author's own analysis

The exponent of the coefficient of age under 25 years for 26-45, 46-60 and 61 and more gave odd ratios respectively 1.153, 0.319 and 0.699. The logistic regression analysis indicated that B value for head of household who is aged 26-45 increases by 0.142, however, it has little impact on the model (p = 0.824) and this group eat fish 15% more than the group aged under 25 years. Head of household aged 46-60, the B value decreases by -1.143, it has high impact in the model p = 0.000, this group eats fish 68% less than those aged under 25 years. B value for head of households, who are aged 61 and more decreases by-.358 this means it has an impact on the model, and this group eats 30% less fish than the group aged less than 25 years.

The exponent of the coefficient of family size 1-4 person for 5-6,5-6,7-8 and over eight persons gave odds ratios respectively 2.691, 3.561 and 1.088. The logistic regression analysis indicated that B value for family size (5-6) increases by 0.990, but it has high impact in the model and p = 0.010 and this group eats fish 169% more than the group who have 1-4 family members. The B value for 7-8 family size increases by 1.270, it has a high impact on the model *p* = 0.001, this group eats fish 256% more than the group who have 1-4 family members. While the B value for heads of households who have over eight members increases by 0.084, this means it has very little impact in the model and this group eats nine per cent more fish than the group who have 1-4 family members.

The exponent of the coefficient of family income LYD600 and less for LYD601-900 and LYD901 or more gave odds ratios of 2.109 and 5.285 respectively. The logistic regression analysis indicated that B value for family's income between LYD601-900 increases by 0.746, however, it has an impact on the model and *p* = .020, and this group eats fish 111% more than the group that earn an income of LYD600 or less. The B value for family income of LYD901 or more increases by 1.665, it has a high impact on the model *p* = 0.000. It means that this group eat fish 429% more than those groups that earns income of about LYD 600 or less.

The exponent of the coefficient of the city of Benghazi for Albeida, Shait and Tobruk gave odds ratios of 1.136, 2.013 and 9.514 respectively. The logistic regression analysis indicated that B value for the city of Albeida increased by 0.128, but it has little impact on the model with *p* = 0.741. This group eats fish 14% more than the city of Benghazi. The B value of the city of Shhait increased by 0.699, it has an impact on the model *p* = 0.309 – meaning that this group eats fish 2.013 times more than those in the city of Benghazi. The B value of the city of Tobruk increased by 2.253, with an impact on the model *p* = 0.000 indicating that this group eats fish 9.514 times more than the people who live in the city of Benghazi.

The exponent of the coefficient of the fish meal easy to prepare gave odds ratios of 2.900. The logistic regression analysis indicated that B value for prepare fish increased by 1.065, and it has a high impact on the model with *p*= 0.000, this group who said fish meals are easy to prepare eat fish 290% more than those who believe that preparing a fish meal is not easy.

On health-related beliefs, the exponent of the coefficient of health-related beliefs gave odds ratios of 0.737. The logistic regression analysis indicated that B value for health-related beliefs decrease by -0.305, however, it has impact on the model where p= 0.361. This group, who believe that eating a fish related meal is healthy, eat fish 0.26% less than those who believe that eating fish is not related to improving health. The details of analysis from which these results are extracted are contained in appendix M. While the previous sections in this chapter have enumerated local demand conditions of fish and the factors that are contributing to low demand, the next section looks at the option of exploring foreign markets since local demand is too low to accommodate any boost in fisheries (that is if current situation still persists into the future).

9.4 Foreign Demand (Export)

This section analyse the extent to which there is potential or possibilities for export leading to growth in small-scale fisheries. Porter (1998) in his diamond model has focused on domestic demand because he believes that this will be an incentive to meet external demand and thus stimulate an increase in export. The findings showed that fish from Libya is usually not exported directly to European countries but through Tunisia. Accordingly, Libyan fishermen and investors are obliged to pay additional taxes for each quantity of fish exported to Europe because they use a third party to do so. This constitutes a financial burden on the fishermen and the Libyan investor. Fish distribution channels through which Libyan fish is exported and then re-imported into the country has been captured in figure 8.17. When asked about the reason for the passage of Libyan fish through Tunisia first, instead of the direct export of Libyan fish to European countries, GR1's answer was clear and sufficient indicating that:

> The big problem is there is no agreement with the European Union with regard to standards and in terms of quality of methods pertaining to fisheries. One of the criteria required to enter Libyan fish is infrastructure, also information on fishing methods. Now, there are committees such as the Union organization from Alonfosmk and Aliikad which examine existing fishing methods and determine to what extent the global standards in fisheries sector exist. I think that the result in the last report was that Libya is not a rogue with respect to fishing. The second point is that the infrastructure which we have started work to establish has now begun to have an impact; therefore, fish produced is healthy fish according to the criteria of the veterinary health control. There is also little pollution in the region according to studies at the Centre for Marine Fish with the FAO, because they did some studies on pollution. And the Libyan coast is one of the coastlines less

> affected by environmental contamination on fish. Also all these things, norms and standards if signed with the EU will directly enable our products to enter markets.

In addition, the development plan of the Libyan marine sector 2006-2010 confirmed that one of its goals is to increase the volume of exports. However, there was a decision to stop the export of fish in 2009. WS1 stated that:

> Although we started to export fish from years 1990-96, the Libyan government took some decisions that made fish export impossible.

Fish export became only a limited class and after that, in 2009, fish export was totally banned. The decision of the General People's Committee of Libya, that is, the government, to prohibit the export of fish abroad led to mixed reactions from activists in this sector as stated by many officials. The decision of the state during the year 2009 was contrary to this plan, where the state banned the export of fish completely and this decision confused traders and fishermen and it had a significantly negative impact on the industry. While some defended the decision as it served the interests of the producer and consumer alike, others believe it is an unjust injunction.

Furthermore, an official at Marine Resources stated that the Libyan state is currently involved in on-going negotiations with the European Union to accept Libyan fish exports to Europe instead of them being exported via transit countries. This confirms GR1's comments in his interview. Also WS1 stated that:

> Stopping export operations reflected negatively on the rate of production. Previously, there was legislation that allowed the export of fresh fish from Libya; however, more recently (2009) legislation has allowed only the importation of fish. Consequently, this has had an impact on fish prices i.e. fish were sold at lower prices, which was suitable for Libyan consumers.

Some of the participants suggested that export is an important factor for the improvement and development of fisheries, for example, WSI commented thus:

> One of the most important factors that support the fishing process and raises the living standards of workers in the fishing sector is the adoption of the liberalisation of trade in fish and giving the fishery industry the opportunity to export surplus production from the Libyan coast, which is known for its high quality and is free from contaminants.

FR2 also observed that:

> We found that during the export phase, selling prices were high, thus encouraging local fishermen and motivating them to enhance the practice of fishing.

In addition, FM1 also suggested that the government should allow the export of fish because if they do not reverse this decision many of the traders will leave this profession. Six years on, the ban on export of Libyan fish is in effect.

9.5 Summary

In this chapter, demand conditions in the light of Porter's diamond model were analysed to explore the sources of the competitive advantage in this determinant. The fish marketing systems are traditional and less competitive but play a vital role in supplying fish to consumers, thus considerably contributing to the value adding process. According to PDM there are three determinants of competitive advantage: the size of domestic demand, nature of buyers' needs and foreign export. In the theory of competitive advantage, these three factors must be strong to allow vendors to compete with each other or, alternatively, with vendors of other types of animal proteins. Important findings regarding the demand conditions have been drawn and which are constraining fish consumption are related to: availability of fresh fish, high price when compared to other animals protein, culture and traditions, convenience and ease of preparation, taste, health benefits, aroma, quality, transformation of the fishery into an industrial and commercial venture and fishery management impediments. Because local demand is not sophisticated due to the above reasons and factor conditions mentioned in the previous chapter, fish export market has not met international standard and remain poorly developed. This means that until these factors outlined in sections 9.1-9.4 are addressed, demand conditions are still far from being a source of competitive advantage. If you take the finding that per capita income as a factor considered important to increasing fish consumption, analysis of per capita consumption of fish with the price of fish indicates that any increase in income and standard of living will significantly contribute to an increase in fish consumption in Libya. Porter's model in this case has assisted in enumerating the problem, but the industry neither satisfy local demand nor reach any competitive level that would make any meaningful contribution to diversify part of the Libyan economy. Libya, therefore, need to use this information on demand deficiencies in developing policies for increasing fish consumption with particular attention to national food security.

Fish is central to attaining food security in Libya. Apart from its role as food rich in major nutrients, it has economic potentials throughout the value chain, from fish production, through to processing and distribution to the final consumer. Despite these benefits, fish has not received the attention it deserves in the Libyan food policies. In all the Libyan development plans examined in chapter three, the main goal is to improve quality of life of Libyans. It was well documented in the chapter that government policy aimed at solving food insecurity includes the development of agriculture, fisheries and marine resources. However, priority attention was not given to the gathering of data regarding nutritional needs and factors affecting individual food choices so that programs are designed to eliminate nutritional deficiencies. The first five-year plan (1976-1980) was a strategy to achieve long-term economic goals by evolving strategies that ensures self-sufficiency by reducing problems relating to agricultural production (including fisheries), distribution (by creating clusters in new agricultural areas) and consumption.

Since the Libya is suffering from food security issues, it is important that certain policy options can be drawn from the demand conditions of Porter model to increase consumption of fish. It must also be noted here that Libya suffers from poor agriculture characterised by desertification, crop failures and environmental degradation. These conditions are caused by both natural and man-made factors, including climate and desertification, soil degradation, declining land productivity, loss of biodiversity, and poor and instable policies, among other problems. As a result, it has become difficult to produce sufficient rain-fed food crops. Paradoxically, the Libyan coastline is home to hundreds of fish species that are potentially ready to be exploited for food security and national development. In this context and based on the findings of this chapter, Libya has to develop a policy for the fishery, giving sufficient attention to food security concerns by addressing issues relating to price, fisheries marketing, fish quality, exploring opportunities to raise fish supplies, improved marketing and increasing awareness about the benefits of fish consumption. First, if you want to increase fish consumption, it can be achieved through the production of low cost fish as fish price is one of the main factors limiting the purchase of fish. However, to reduce per unit price of fish, production and distribution factors have to be effective and developed. Moreover, the price of fish must also be competitive to that of red meat and poultry products. Second is to set priority in terms of fish canned production as it is evident that there is high demand for canned fish even from those who do not consume fresh or frozen fish. Detailed policy interventions in Libyan fisheries can be found in the concluding chapter of this thesis (see, section 12.5). The next chapter presents findings about the conditions surrounding strategy, structure and the role of the government in the fisheries sector.

Chapter Ten

Strategy, Structure and the Role of Government in Fisheries

10.0 Introduction

According to Porter (1998:107), the structure, strategy, and rivalry of industries are "the contexts in which firms are created, organised and managed as well as the nature of domestic rivalry". He also states that "the goals, strategies and ways of organising firms in industries vary widely among nations". In this study, structure, strategy and rivalry are all related to the management and organisation of fisheries as well as the nature of competition in the local market. The discussion covered in chapter two and three shows that the Libyan government is responsible for the planning, developing strategies and operations of all the sectors in the national economy. This also applies to the fisheries sector, where the development of the structure, strategies and institutions of the fisheries sector is government's responsibility, and to an extent dictates on who enters into the sector and operates at an industrial scale. Therefore, this chapter combines analysis of the following two determinants: the strategy and structure of industry and the role of the government in the fisheries sector (see Figure 10.1 below). In the case of the Libyan state these are two sides of the same coin. Domestic rivalry which reflects the nature of competition in the local market is also discussed in this chapter.

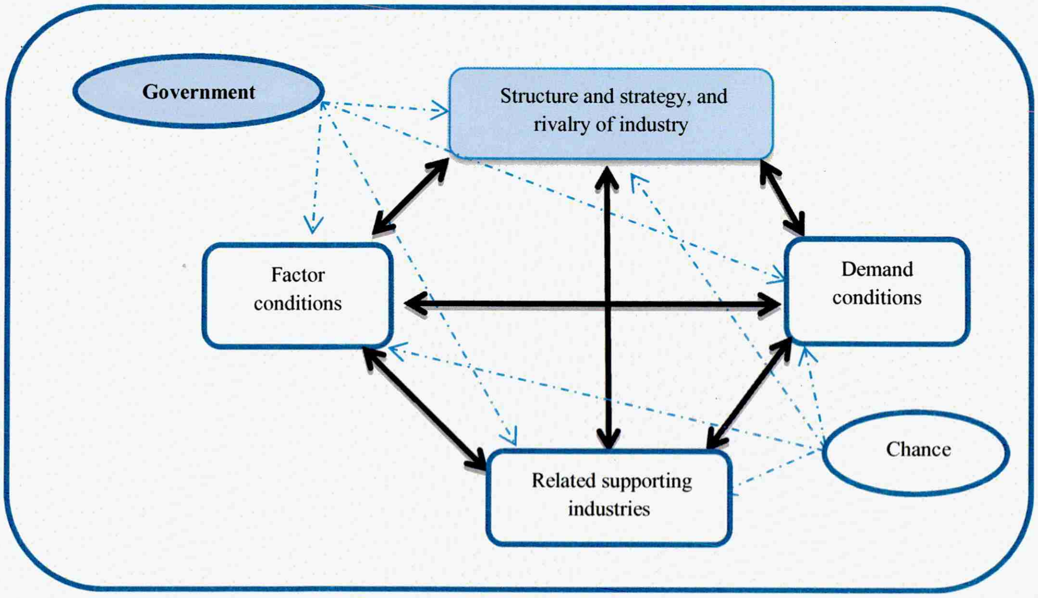
Government
Structure and strategy, and rivalry of industry
Factor conditions
Demand conditions
Chance
Related supporting industries

Figure 10.1: Focus on strategy and structure of industry and the role of government as part of PDM

To assess these determinants, two questions were asked. 1) To what extent does the management of fisheries, legislation and regulations issued by the government help (or influence) the determinants of the development of the fisheries sector? 2) What is the nature local fish market competition? Answers to these questions are derived from interviews and questionnaire responses and are contained in this chapter. The answers are organised into seven sections before the summary. While section 10.1 first explores how economic policies and political situations have influenced fish production, section 10.2 assesses fishers' satisfaction of government influences. The Libyan government has been consistently been criticised as being corrupt, section 10.3 examines what damages that has done to fisheries. The management aspects of fisheries in support of fisheries were evaluated in this section. Subsequently, findings such as unstable policies and legislation (10.5) and lack of investment (10.6) were presented. The final section reveals other situation of fisheries sector strategy, structure and rivalry in Libya.

10.1 Economic and Political Influence

The discussion in chapter three (see sections, 3.2-3.3) reveals that oil revenue is Libya's exclusive source of funding the economy. The role of other sectors and industries, such as agriculture, which played a significant role in the Libyan economy before the discovery of oil, has diminished over the years (United Nations, 1952; Al-chukhucka, 2003; Metz ,2004). The agricultural sector used to employ 70% of the total labour force and contributed about 30% to the GDP prior to full oil exploitation (El azzabi, 1974). In addition, all revenues from oil are controlled and managed centrally by the ruling power, from Monarchy to the reign of Ghaddafi. Furthermore, Libya, like most oil-rich developing countries, is managed by a non-democratic authority and suffers from weakness of governmental and civil institutions, mismanagement of resource wealth and widespread corruption. All of these indicators led to the emergence of Dutch disease and the resource curse in the Libyan economy (see chapter two). Therefore, it is important to evaluate the way in which the overall economy impacts on the situation, management and development of fisheries.

The findings of this chapter show how the political and economic situation of the government is reflected in, and indirectly affect, the fisheries sector. This can be seen in four aspects related to the structure and strategy of the fisheries sector, which are: institutional instability and widespread corruption; poor management of small-scale fisheries; unsuitable policies and legislation; and lack of government investment. Figure 10.2 shows that the economic and political situation of the Libyan state is shaped by the overwhelming role played by government in the economy, which is a command economy. How this arrangement impacts on achieving competitive advantage can be found in chapter ten.

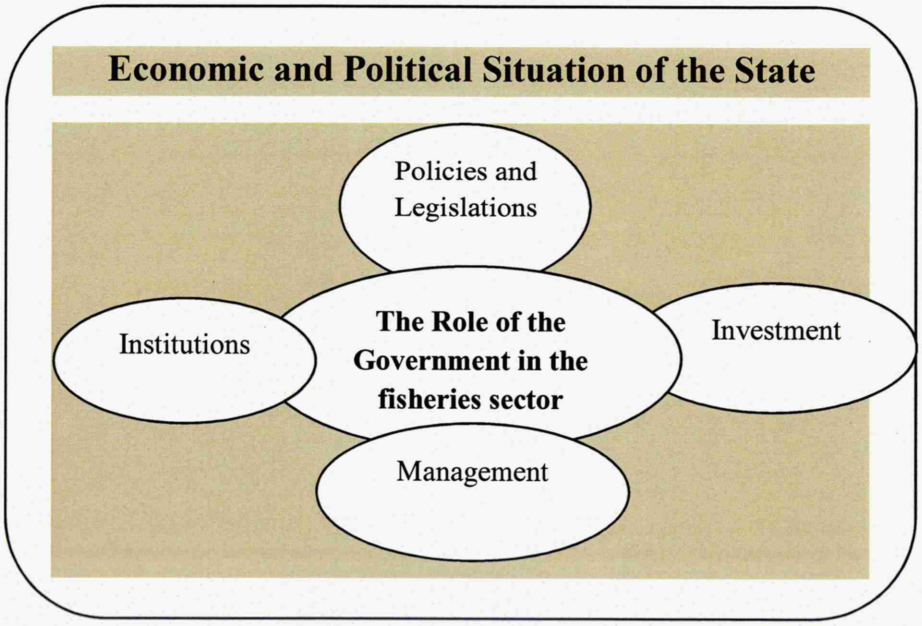
Economic and Political Situation of the State
Policies and Legislations
Institutions
The Role of the Government in the fisheries sector
Investment
Management

Figure 10.2: Government's role in the Libyan fisheries sector.

10.2 Satisfaction of Fisheries with the Role of Government in Small-Scale Fisheries

At the outset it is important to explore the extent of user satisfaction for this sector in which the government plays such a key role. The government failed to gain users' satisfaction in the fisheries; a quick reading of the findings in chapters eight and nine shows the extent of this lack of participant, i.e. fishermen, satisfaction in this study. Concerning the level of satisfaction of fishermen with the role of government in the fishing industries, the majority of participants (96%) are not satisfied and only two per cent of respondents expressed their satisfaction (see figure 10.3). To what extent the two per cent are satisfied with government involvement cannot be expressed.

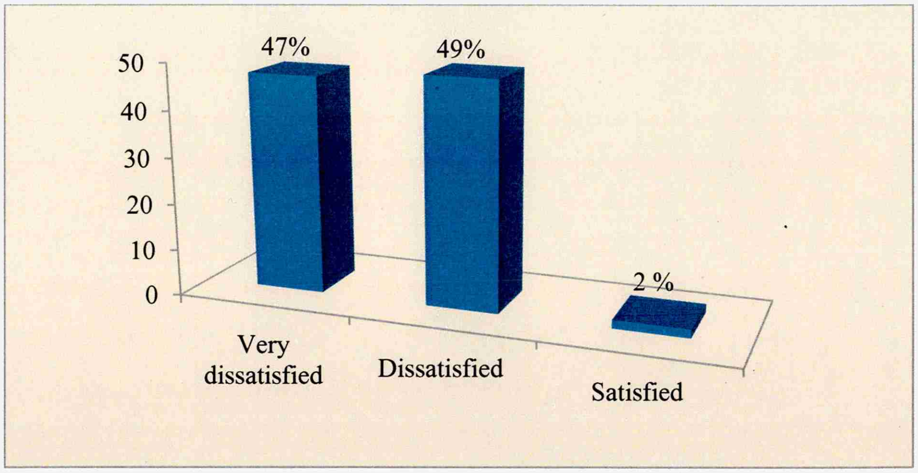

Figure 10.3: Satisfaction of fishermen with the role of government in the small-scale fisheries.

In terms of the facilities and assistance provided by the state to fishermen, 89% of respondents noted that the government did not provide any facilities, while 11% pronounced that government is providing the facilities and assistance they require. In search of the areas of assistance government has provided to fishermen, figure 10.4 below shows that five per cent of the sample noted that the government provides loans to fishermen, while two per cent are said to have gained specialised workshops for maintenance of boats provided by the government. According to three per cent of the respondents, the government determines the pricing for fish types; meanwhile only one per cent of the sample indicated that the government pays attention to the infrastructure of the ports. Those that have not benefitted from government facilities indicate self-help efforts so that they can sustain their means of livelihood.

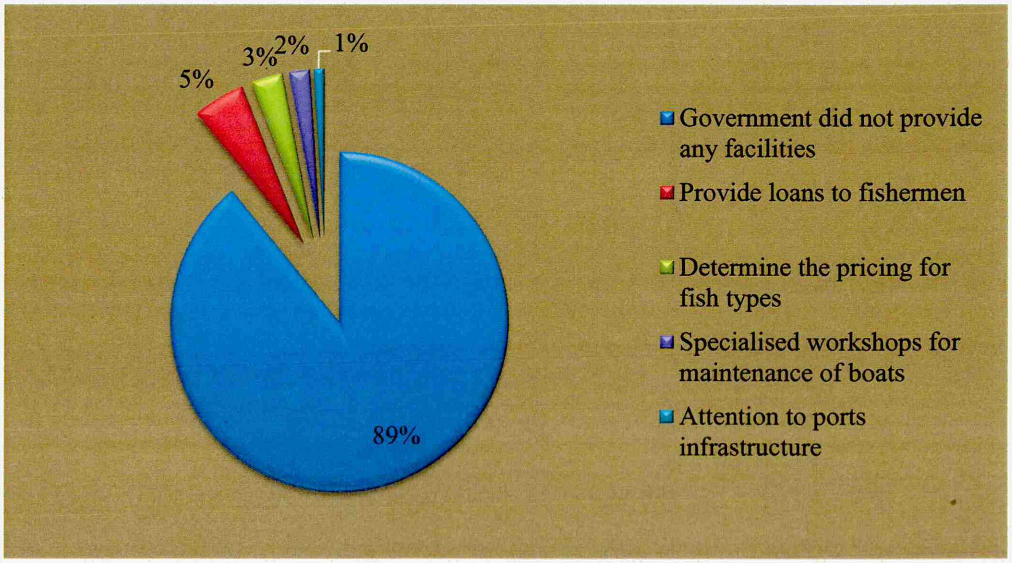

Figure 10.4: Satisfaction of fishermen with the role of government in the fishing sector.

10.3 Corruption

Increasing concerns about corruption, especially in the oil industries, is also leading to greater interest in the governance of fisheries. Corruption and negligence in the monitoring of the assets and the funds of the state in Libya in general could be attributed to the weakness of the institutions. Some participants pointed out that public projects in the fishing industry often suffer from financial corruption and negligence. Meanwhile, some respondents highlighted the way deposed government officials have played a decisive role in hampering other sectors. Their argument was based on administrative failure, which creates instability, and in turn corruption throughout the entire system. The findings showed that administrative and financial corruption is one of the reasons for the lack of success of any project that supports fish marketing or that is related to investment in this vital resource. In fact, fish projects are seen as another conduit pipe for corruption or for rewarding political loyalists to Ghaddafi. For example, (FR1) holds that:

> The Libyan state tried to focus on marine resources projects as a source of production and finance. But this was not well planned, but rather improvised. They were mostly public sector projects, state-owned so were vulnerable to theft and neglect by supervisors. That is why the fishing marine companies were unsuccessful. This led to the failure of the infrastructure that was set up, such as, in particular, the complex refrigeration, ice plants and the freezing tunnels. And even one giant fishing port collapsed and sank into the sea due to neglect and lack of periodic follow-up maintenance. It collapsed because the work was not done to standard and the contractor connived with officials to execute poor work.

Corruption and negligence is widely spread in most of the businesses that are related to investment in Libya. For example, report from the office of marine resources in Albeida city holds that:

> In the Green Mountain region, which is located in the east of the country, there is one port called 'Sousah' and three harbours; Hamamah, Hanniyah, and Libya Palace. Here there are 16 registered fishing companies. However, they are all not currently working. There are also a number of smaller fishing companies which are registered, totalling 43 and none of which are currently working either. The number of Jarafat (boat type) is four; however, three of them have disappeared and only one is still working.

The above situation means that these companies might register simply to obtain loans from the government and only pretend to be working in the fishing industry when essentially they are not present on the ground. There is evidence of negligence and corruption. Some pointed out that the private sector is much less prone to corruption and private fishing enterprises are more efficient and successful. For example, the development plan of the Libyan marine sector 2006-2010 (National Foundation for Maritime Investment, 2005: 29) reported that:

> Production capacities for all public sector companies are very weak and close to zero. However, Wafa manufacturing is a private firm whose activities are excellent.

In addition, FR1 state that:

> The private sector, despite its lack of potential and dependence on primitive and old methods, was able to create a local market and depend on methods of supply and demand, but these do not solve every problem.

Corruption and the consequent impediments to the development of institutions are further discussed in chapter eleven.

10.4 Poor Management of Fisheries

The findings indicated that the ways in which fisheries sector is managed in Libya is unclear as a result of institutional instability. Public institutions have been constantly undergoing restructuring processes in a supposed bid to undertaken new functions in accordance with the development plans. This has strongly constrained the overall development of the sector and weakened the capacity of some institutions by creating unstable policies on activities and problems of staff motivation. With regard to poor management, the fisheries sector has passed through several stages:

1) Centralised administration phase: this occurred during the period of the General People's Committee for Industry, then the General People's Committee of Marine Wealth. In addition, in the municipalities, there was a People's Committees phase.

2) Transitional phase: where fisheries were centrally managed through the General People's Committee for Marine Wealth, and locally by the People's Committees of Marine Wealth.

3) Local administration phase.

Changes in administration have a negative impact on both the economic and environmental aspects of the marine fisheries. In addition, the findings of the current study confirmed that there is a wide gap between government policy and those working in the fisheries sector. This is perhaps one of the reasons for the weakness of artisanal fishing. In addition, the findings also indicated that, fishermen and the fisheries users normally do not participate in any way in the management of marine resources. Moreover, their voices are neglected by the state, which means the fishermen have been excluded in the management of small-scale fisheries. Participant 102 held that:

> The government does not hear the fishermen or listen to their opinions; the government should do so because the fishermen are the ones who know are hands on and operate in the field; thus, what is written on paper without the fishermen's opinion is useless .

The impact of fisheries management and institutional instability on its competitive advantage are discussed in chapter eleven.

10.5 Unsuitable Policies and Legislation

The laws and regulations governing any industry or sector have a great role to play in the success of policies and the implementation of plans in the industry, which could help to create competitive advantage. It seems that the laws and regulations established for the conduct of the fishing industry and marine resources in general impede the development of this sector. The opinions of the fishermen as well as the officials and experts who participated in the field study confirm that the laws and regulations of the fishing and marine wealth sector are generally unsatisfactory. For example, during an interview with FM1 regarding the issue of laws and regulations governing this sector, he said:

> The laws relating to trade and fishing are hampering the fishermen.

The government representative was also dissatisfied with these laws and he confirmed this by saying:

> The laws and regulations governing the fishing process are inappropriate and need to be reformed .

In addition, many of the fishermen noted the problem of illegal fishing by boats coming from other countries, entering the Libyan territorial waters and fishing as there is no strong deterrent in place. This, of course, adversely affects fish stocks and the production of fishermen. For example, FM2 observed:

> There are no adequate laws regarding fishing because the state does not pay attention to this sector. There are no laws that protect the fishermen or protect Libyan territorial waters. The evidence for this is that there are boats coming from Egypt and Tunisia to fish in Libyan territorial waters because there is no defence of Libyan territorial waters.

In fact, the problem is in the implementation and application of the laws. There are laws that provide all the details but they need to be updated and developed. The renewal of regulations and laws in accordance with circumstances on both the regional and international levels helps the development of any industry. For instance, EMC stated that:

> The fisheries legislation (Law 14 of 1989) is considered by many as obsolete. There is a strong need for updating or enacting new laws, so as to support the future fishery policy and to integrate major international developments into fisheries management.

From the results of the analysis, the researcher noted that all the representatives of the government, experts at the marine research centre and many of the fishermen agree that the laws and regulations applicable to the fisheries sector are unsuccessful and need to be modified to promote the marine fishing industry and the sector as a whole.

10.6 Lack of Investment in Fisheries Resources

The study's findings concerning investment in the fisheries sector in Libya in general displayed certain constraints governing investment. These are multiple and interrelated and are confirmed by the interview responses of FAO1, GR1, FM1, FM2, FR1, EMC, and the development plan of the Libyan marine sector 2006-2010. First of all, the poor infrastructure of the marine fisheries, as explained in chapter eight, has a negative impact because it discourages investment in the fishery sector. Secondly, the state did not provide conditions suitable to activate policies that enhance either local or foreign investment. Thirdly, the legislation in force in the fishing industry is not commensurate with investment promotion and development. This is considered a barrier for providing the right environment to investment, as there are no guarantees to convince investors that their rights are reserved and protected. Fourthly, funding, in terms of loans granted to fishermen is very limited. It also constitutes an obstacle to the development and the improvement of fishery growth from small-scale fisheries, which make an important contribution to local investment. Fifthly, regarding foreign investment and engagement in international trade, which is the cornerstone for development and for increasing profits for the fishery sector, what hampered it is the fact that it has to comply with all international standards with regard to standard requirements in terms of the existence of appropriate infrastructure, as well as the methods followed for responsible fisheries: not to use illegal fishing methods.

In terms of government investment in both human and capital resources, the findings show that many participants in the study did not receive specialised training or hold any advanced certification in the field of fisheries. In addition, evidences gathered show insufficient financial allocations for fish. In fact, responses gathered and my observations at the different fish value chain indicate that regulations and legislation as well as the infrastructure (fishing harbours, the technology used or the infrastructure of the markets) is not sufficient to lead to successful investment in the fisheries sector or to reach a position to compete both at domestic and international levels. This deeply affects the development and outcome of fisheries and it impedes paths that could generate competitive advantage in the fisheries (details of these factor conditions are catalogued in chapter eight).

10.7 Context for Fisheries Sector Strategy, Structure and Rivalry

As regards the structure of the marine sector, the findings show that the marine sector suffered from institutional instability. According to the 2006-2010 development plan for the Libyan marine sector (National Foundation for Maritime Investment, 2005:8), the marine sector, which encompasses fisheries sector, has suffered from institutional instability and poor management. As earlier noted in section 10.5, the sector has undergone several administrative changes. From 1969-1975 it was managed by the Ministry of Agriculture; in 1975-1981 it fell under Nutritional Affairs; in 1981-1986 it was moved to the Institution of Marine Resources; in 1986-1988 to the executive body of Marine Wealth; and in 2001 to the Ministry of Marine Resources. It was then annexed by Agriculture and Resources of Livestock in 2001; managed by the General Authority of Marine Wealth and Aquaculture Farms until 2002; Marine Production Affairs until 2004; and then from 2004 it came under the direction of the Inspector-General of Agriculture and the Agency Marine Investment Centre (National Agency for Marine Investment (2005). It has been under the General Authority for Marine Wealth until today. These frequent changes of ministerial heads, institutional supervision and policies have constrained the promotion and strengthening of Libya's fisheries sector. The last 15 to 20 years witnessed the high frequency of changes in public institutions because the autocratic system of previous government was characterised by monopolisation of power in the hands acquaintances and leave them to operate unilaterally with few or no institutional constraints on their power. As such, they constantly alter arrangements to suite their goals. The fisheries sector is the hardest hit of this kind of arrangement and is a reflection of the low priority given for promoting productivity and food self-sufficiency.

In addition, cooperatives are an important feature of the fisheries sector; however, cooperative societies' role is ineffective. According to the findings from data analysis, in terms of fishing in small-scale fisheries, there are cooperatives which are often run in small groups. However, currently, social institutions play no role whatsoever in the fisheries sector and responsibility for decision-making in the Libyan fisheries falls solely to the government. Non-governmental organisations, such as the cooperative societies, that are supposed to assist the government in implementing fisheries development programme do not play any role in Libya's eastern coast fisheries. Fisheries cooperatives are few, and even among them, majority are mainly dormant, poorly organised managed, lack finances, and not making tangible impact to fishers and their communities. Therefore, the percentage of the fishermen who registered as members of cooperative societies did not exceed 10% of the total participants, while 90% of the sample are not members in any cooperative societies (see figure 10.5 below). When asked the reasons for not registering with any cooperative society, majority claimed that they were not aware or it is just waste of time, others maintained that there is no good leadership because they only connive with government or are government agents themselves.

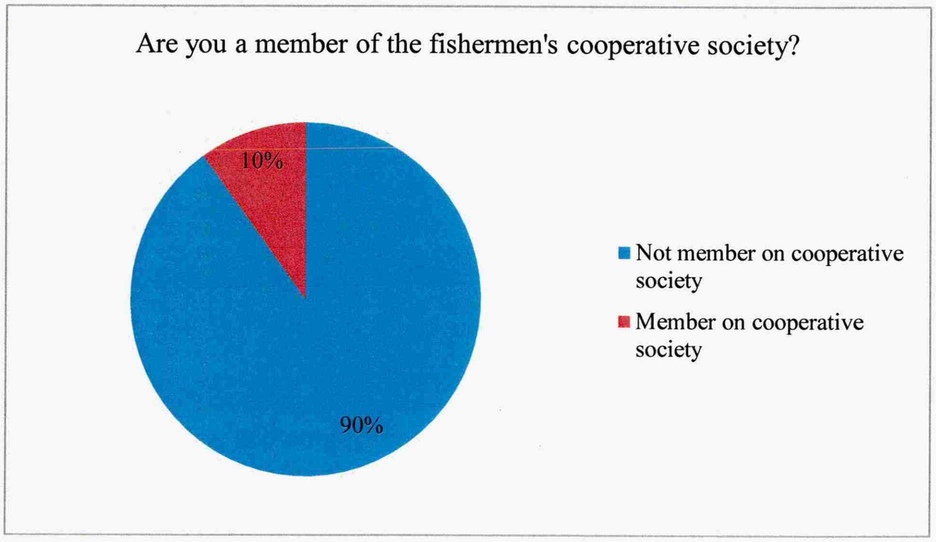

Figure 10.5: Membership of the fishermen in cooperative society.

The proportion of fishermen who registered as members of cooperative societies did not exceed 10%, while 90% of the sample is not registered members of any cooperative societies. Some of the participants thought that the cooperatives were ineffective in terms of providing services and facilities to the fishermen. While the researcher found it difficult to obtain information from fishermen years of registration with cooperative societies, their reasons for joining cooperative was sought. Around 60% of them indicated providing the necessary equipment for fishing such as spare parts for fishing boats and fishing accessories at reasonable prices, while 30% indicate facilitating the sale of their produce, and around 10% demanded for transferring their votes to the state, and so on. For example, participant 42 stated:

> Cooperative societies, in fact, exist but there is no point to their existence. It should be noted that I speak as a member of one of these associations.

On the other hand, many of the participants pointed out that the establishment of effective fishing associations, i.e. guild type organisations, and related social institutions would have a positive impact on the fisheries sector as a whole. For example, participant 8 said:

> The associations help to rehabilitate the fishermen in this area.

In addition, participant 3 held that:

> The provision of fishing associations will be a reason to work to the fullest capacity.

These institutions should be considered as a bridge between the users of this wealth in general and the government as it is difficult for the fishermen to communicate easily with the government. For example, FM2 noted that:

> The state does not provide any help to the fishermen despite many claims that it provides help through granting loans or financial assistance for the purchase of fishing supplies. Unfortunately, no one cares about us or solves our problems.

The results demonstrated that there is an urgent need for such institutions as well as state institutions that could regulate the industry and protect its users whether they be fishermen or dealers. For example, FR1 stated that:

> In creating such institutions the state seeks to protect both the consumer and the product. Furthermore, it seeks to protect the process of regulating domestic marketing and create a fund to support fishermen.

Regarding domestic rivalry, findings showed that the markets of other types of animal proteins, which are red meat and poultry, represent strong competition for the fish market. This is because chapter nine has analysed the major competitors or rival protein to fish. You may recall that beef, lamb and chicken are by far, the favourite type of meat desired and consumed by Libyan consumers when asked to indicate their preferential choice, regardless of price or access to the product. While these meat products are readily available at a cheaper price, high fish prices and the shortage of availability have put fish markets in a weak position. The findings reveal that the highest proportions of the sample were consumers who usually eat chicken, representing 36%, followed by 35% of the sample, who usually eat lamb (see sections 3.2 and 9.2.2). Consumers justify their motivation for buying these types of protein citing many reasons (see chapter nine). However, the two reasons that have the highest percentage are the fact that fish is not readily available and that it is expensive compared with other proteins. The majority of households prefer to buy chicken, lamb, beef and other proteins which are easy to obtain and easy to cook. Participant 210 sum his preference as follows:

> One of the obstacles that prevent fish from being an important food in Libyan society is that meat and poultry are plentiful and permanently available in comparison to fish scarcity and the distance travel to buy fish.

The findings in chapters eight and nine showed that captured fish is not readily available. Most respondents who are willing to consume fish complained about a supply problem of fish in their cities. Moreover, fish markets are usually located far from residential neighbourhoods' - shops, small grocers, stores and farmers - which is why some family heads prefer to buy the types of protein which can be bought in a great number of locations and which are easily accessible to them. Through these results we can say that the lack of distribution outlets of fish, as well as the lack of specialised markets for fish are among the most important obstacles and limitations that prevent this protein, well-suited to healthy-eating, from appearing on the table of Libyan citizens. Moreover, producers are unable to access the market to sell their product to the consumer due to the lack of sufficient and appropriate places for the display of their produce to consumers. Thus, the absence of specialised markets and the insufficient number of fish traders are some of the factors that led to consumers being denied access to fish; hence their preference for meat and poultry products. These factors seem to present challenges for vendors of fish, but there are many ways to overcome them and to find effective solutions to them. These will be discussed from the standpoint of Porter's demand model in chapter eleven.

10.8 Summary

The political system in Libya has a profound impact on economic policy and the formation of the role of the government. With regard to the management of the Libyan government in the last 40 years, all sectors, industries and most firms and banking institutions are usually run centrally (Rheannon, 2011). Bakan and Doğan (2012) believe that government improves or damages national competitive advantage because it is the government that designs the plans, sets objectives and strategies and implements its programmes and, where necessary, enforces regulations. Therefore, it is clear from PDM findings that only the government is responsible for the outcome of the fisheries sector because it is behind the formation of the administration, institutions and is solely responsible for developing laws and legislation without any involvement of any other institutions and voluntary organisations such as fisheries cooperatives (see figure 10.2). While the Arab Spring has had a profound impact on Libya, an opportunity has arisen for exploring the full potential of the fisheries sector by changing the current state of government interferences.

The performance of the government in relation to the fisheries sector is low and its control over the management of artisanal fisheries does not allow users to participate in managing artisanal fisheries. This made the majority of the fishermen dissatisfied with the government's performance, with the exception of a few. The findings from data analysis also show that the cooperative societies do not play any role in the fisheries of the eastern coast of Libya. However, their participation in the performance of artisanal fisheries is effective from the viewpoint of the fishermen - they can implement government programmes by monitoring who fishes, take stewardship actions, for instance delineating protected areas, and enforcing limits on fishing gear. This dominating role of the government in every sector negates or calls for the improvement of PDM to include government roles among the four major conditions. To address these issues so that fisheries will be revitalised, the private sector also has a responsibility and an important role to play within the reform process. The marine resource sector in general suffers from institutional and administrative instability, which has had a negative impact on the development of this sector. The findings from interviews with fishermen suggest establishment of some factories to support the production of fish; however, a lack of follow-up and rampant corruption in the sector has led to the waste of these assets and properties; they have not been taken advantage of. This was the opinion of FR1:

> The Libyan state tried to focus on marine resources projects as a source of production and finance. But this was not well planned, but rather improvised. They were mostly public sector projects, state-owned so were are vulnerable to theft and neglect by supervisors. That is why the fishing marine companies were unsuccessful. This led to the failure of the infrastructure that was set up, such as, in particular, the complex refrigeration, ice plants and the freezing tunnels. And even one giant fishing port collapsed and sank into the sea due to neglect and lack of periodic follow-up maintenance.

The above expression only implicates those companies that obtain licence simply to access loans from the government and pretend to be working in the fishing industry when essentially they are not present on the ground. Similarly, the National Foundation for Maritime Investment (2005: 31) reported that one of the major problems and difficulties that face the activities of marine resources is poor infrastructure and a poor support services sector. Furthermore, the report has indicated that factories for boat making and maintenance remains traditional and as such is limited in modern fishing boat maintenance. There is only one factory for canning tuna based in Benghazi. The implications of the PDM in general, and in particular the model's applicability in a resource-cursed country like Libya, are discussed in chapter eleven.

Chapter Eleven

Discussing Research Findings and PDM Model

11.0 Introduction

This chapter brings together the various strands of this investigation and provide answers to the initial research questions and objectives of the research. The study used mixed-methods (qualitative and quantitative) to apply a critical realist approach to understanding the current status of the fisheries in Libya and to explore the factors that affect their development. A case study approach was carried out in the coastal areas of the eastern region of Libya so that it reflected both country-specific aspects and aspects of international competitiveness. The findings from these methods were attempted together with a consideration of the existing literature on PDM. The successes and limitations of the findings are considered in each of the diamond determinants with a view to grounding this work in the model and other related studies. The following section (11.1) give a summary of the major findings of this study based on the determinants that allow the fisheries sector to gain and sustain competitive advantage. These findings are then discussed in detail with reference to Porter's Diamond Model (PDM) in section 11.2. The summary (11.3) calls for the modification of PDM to capture Libya's peculiar situation, particularly the role of government in driving fisheries potentials to competiveness.

11.1 Summary of Research Findings

The main thrust of the study is to evaluate the competitive advantage of fisheries as a means of diversification of the Libyan economy from over-dependence on oil wealth using Porter's (1998) 'diamond' model (PDM). This analysis contributes towards: 1) a better understanding of the competitive structure and the ability of the fisheries sector to participate in the diversification of the Libyan economy, and 2) the improvement of the diamond framework to suit oil-rich developing countries such as Libya that is bedevilled by the resource curse. Specifically, the study analysed the six broad factors incorporated into Porter's diamond, which has become a key tool for the analysis of competitiveness, and has been used to address the aims of the study: factor conditions; demand conditions; related and supporting industries; firm strategy, structure and rivalry; role of government and chance. The last three chapters have highlighted several key areas of competitiveness for fisheries development based on these factors. The major findings of this research based on these six determinants are presented in this section and how that addressed the four research objectives is discussed in section 12.1.

1- Factor Conditions

The strategic location of Libya, alongside its possession the one of the longest coastlines in the Mediterranean, together with its abundance, quality and accessibility of fishing grounds, coupled with key potential export markets for goods and capacity to import cheap labour', are considered sources of competitive advantage in the international fish trade. Yet these enormous potentials are not fully exploited. Insufficient data has been collected about fish stocks and degrees of pollution in the Libyan water, which severely limits the success of any plans and the ability of potential investors to use adequate and reliable data in investment decision-making.

Two other factor conditions were identified as major impediments to the achievement of competitive advantage. The first is the lack of investment in human resources; as a result, there is a dearth of highly skilled and educated fishermen in the fishing field. That is why the sector is dominated by artisanal fishing, which is inefficient, risky and difficult to achieve scale. The second is poor investment in infrastructure and capital. As a result, the poor infrastructure of fishing harbours affects both the capacity and efficiency of the fishermen and boats. There is also a lack of maintenance workshops in the ports, high price fishing gears and inadequate means of transporting fish and ice, and poor basic services for fishermen in harbours. Any infrastructure available to keep fish in good condition was instituted through self-effort. All the traders have a good level of knowledge of the traditional ways to preserve fish, and the vast majority of suppliers have refrigerated cars for transport; however, there are limited ice factories. The absence of modern technology in fishing and the fishermen's inability to use modern methods and techniques has negatively affected their ability to enhance the productive process in this field. Financial resource was not considered a hindering factor because oil and gas remains a key source of finance; but the ability of many other sectors across the economy to contribute to development and food security, in particular the ability of the fisheries, was neglected due to the effects of the resource curse or the Dutch-disease syndrome.

The above factor conditions has shown that Porter model has been useful in identifying all the factors available, those required and current conditions of Libya's fishing industry that can be built upon. Understanding these factors provides useful starting point for strategic analysis of the sector and in developing fisheries based on these sets of factor conditions. However, the factors that are influencing fishers within fishing industry can be extremely various and those of other sectors also overlap and vary. Thus, it requires further analysis to determine sector-specific requirements, for example between small-scale and industrial fishing goal. Therefore, it is sensible to concentrate on only those factors that are specific for all companies within an industry. It must also be noted that in Libya's case, political initiatives and socio-cultural changes, for instance, may shape the degree of factor efficiency and effectiveness in the way they are deployed in fisheries determines their influence on competitiveness of the sector.

2- Demand Conditions

According to Porter, demand conditions describe the state of buyer needs for products, in this case fish in Libya. The size of the domestic market for fish is small. Fish demand hardly seems a source of competitive advantage in the current domestic fish market in the eastern region of Libya. Only 9.5% of consumers eat fish more than 3-4 times per month, which is the highest level of consumption in the eastern region of Libya. Out of these, a majority of them consume canned tuna and sardines. Whilst the World Health Organization (WHO) recommends an average 16 kg/per year fish consumption per capita, fish consumption for one individual in Libya is extremely lower: 6.4kg/year per capita for fresh. There are many reasons for the poor fish-eating habit: the most important are high prices and insufficient fish markets. Fish species, season, quantity, ice, laws and regulations, labour, weather, export, and culture are the factors that affect fish price. The limited availability of places for selling fish in the form of outlets and shops selling fish account for low fish consumption. However, asked about their food preferences, this study's respondents put fish in second place, after lamb, but ahead of beef. The limited demand condition prevalent in Libya might drive investors or the government to consider entering into the international fish market of the surplus to achieve competitive advantage.

In this part of the thesis, investigation was based on Shepherd's (1985) model of fish consumption. These factors are: factors related to social habits and culture; physiological effects and psychological factors; perception of sensory attributes --

which comprise fish aroma and fish taste; factors related to food which includes nutrient contents and quality of fish; and economic factors which include prices and availability of places for selling fish. In terms of customs and traditions, fish is not considered a main meal in the eastern region of Libya. Respondents prefer not to serve fish to guests, as it traditionally indicates lack of respect for the guest; fish could only be served as a side dish, accompanying a main course of red meat. Fish consumption was linked to thirst in the summer and skin allergies. Aroma and taste perception has an effect on the frequency of fish consumption where it has an influence on the decision of the head of the family. About half of households interviewed elucidate that fish and fish dishes are not easy to prepare compared with other proteins, such as meat; the preparation of fish requires time and effort, and thus fish is rarely bought. This may be due to the increase in the number of working women; in Libyan culture it is women who prepare meals for the family. Chicken meat consumption is the highest compared with other proteins because chicken is widely available and its price is cheaper and affordable. This was followed by fish in terms of preference as a source of protein but not necessarily by consumption. Hence, the prevailing belief (held by 81.5%) is that eating fish has a positive impact on human health even though 72% have no precise understanding of the nutritional value of fish. Findings indicate that Libyan consumers often do not pay attention to the nutritional value of fish during their food choice. However, the demand and consumption of fish is likely to change as society becomes aware of the value of healthy eating and as fish becomes cheaper and more readily available.

The main advantage of Porter's demand conditions as seen above has enabled the documentation of a clearer picture of the demand conditions of fish that is not hitherto well understood. Porter's model with the aid of Shepherd's model has allowed for a complex and in-depth investigation into the characteristics affecting fisheries such as the scope and growth rate of demand, the mixture of consumer needs and wants, socio-cultural and religious barriers, and the mechanisms that transmit preferences to domestic or foreign fish markets. Such an understanding provides signals of demand trends and how that is likely to progress in the advent of redevelopment of the sector. What this means is that, regardless of the state of factor or the rest of the determinants, competitiveness of fisheries is impossible to be achieved unless the poor fish demand improves to allow for increasing supplies and successful realisation of fishers products.

3- Related Industries and Industry Support

Libya has a good transport infrastructure linking the main areas of fish production by land, sea and air, which can attract investors in logistics and distribution. There are also educational institutions, including universities that have the potential to support fish industry research and innovation. On the other hand, the lack of technology and lack of fishing industrial clusters are drawbacks. It was found that even though the raw material- in this case fish – is readily available in abundance, other related channels, such as processing, handling and marketing that make the product available to consumers are not well developed. The key factors influencing supporting industries related to fisheries are high costs of production, the limits of the Libyan market, lack of a skilled national workforce, institutional instability, lack of funding, poor management of public factories and an underdeveloped infrastructure.

Porter believes that once supplier industries are able to possess an international advantage, the downstream value chain could benefit from in many ways, such as access to cost-effective inputs. A fast-pace innovation within the entire fisheries could have been achieved with joint problem solving or transmitting of information from the suppliers to materials or equipment to fishers. As the Libyan case has shown all the above benefits, including new methods and the opportunity to apply new technology, are not stimulated due to the dearth in the industries and activities related to fisheries. If Libya continues to have related industries which lack competitive advantage, the possibility for achieving sustained success in fisheries can prove a herculean task.

4- Strategy, Structure and Rivalry of Industry

This determinant allows for consideration into how the prevailing circumstances of a country determine how companies are established, managed and organised, and as a result determine the features of domestic competition. Unlike in developed societies where the private sector works as a strong partner with governments in developing, implementing, and evaluating reforms and institutions, the Libyan government is wholly responsible for the ownership and the development of the structure, strategies and institutions of the fisheries sector. Aspects that relate to the structure and strategy of the fisheries sector are institutional instability and widespread corruption, poor management of small-scale fisheries, unsuitable policies and legislation and lack of government investment. That is why there are incessant changes in the way fisheries sector's institutions and strategies are structured. Institutional instability prevents fisheries from succeeding as a diversification strategy. First, instability of institutions makes it difficult for any administration to continue the implementation of its full plans and the disbursement of the budget on projects in an orderly and appropriate manner; there are obvious frequent changes - between 10 and 12 have taken place since 1969. Second, unsuitable policies and legislation: the laws and regulations applicable to fishing are inappropriate for organised private investment and this hampers investment projects.

The opinions of fishermen, as well as state officials and experts who participated in the field study, confirmed that the laws and regulations of the fishing and marine wealth sector is generally unsatisfactory and unsuited to attract and protect investment. Updating these laws is necessary for the development and upgrade of this sector. Third, fishermen were excluded from the management of small-scale fisheries. The fishermen and the fisheries users generally do not participate in any way in the management of these resources. Moreover, their voices are neglected by the state. This has a negative impact on both the economic and environmental aspects of the marine fisheries. Fourth, corruptions in public sector projects, including theft, looting and favouritism due to the lack of administrative control by the state apparatus hinder the sector. Lastly, the ineffectiveness of the part played by cooperative societies was identified as a failure from the government to organise fishing. The setting up of cooperative societies of fishermen without activating them to support fishermen indicates how they have failed in their purpose. This also indicates a lack of cooperation between fishermen in the management of their business, and a failure to create a bridge between fisheries users and the government.

Analysis of the current state of fisheries indicates that dynamic sectors are limited. Problems encountered in various aspects of fish production (e.g. catch, regulation, handling, transportation and market) discourage fishing as a business. The red meat and poultry markets are currently the strongest competitors to the fish market and are considered most critical in driving the fisheries to be cost competitive, innovative and to improve quality and affordability.. From Porter's point of view on domestic rivalry, the findings indicate that the existence of domestic rivalry reduces the over-bearing reliance on factor advantages and forces countries like Libya to upgrade and condition more efficient deployment of fisheries to commensurate rising demand sophistication. Going by Porter's postulation and analysis on firm strategy and structure means that individual and company goals and as well as national priority should be reflected upon and integrated in the process of enhancing productivity and effectiveness.

5- Government Conditions

PDM categorises government as complimentary to the four major determinants; but as noted across the thesis, the Libyan government rules, policies, and strategies in all sectors is overwhelming. In contrast, the government has a negative impact on fisheries, and as such, government's performance has failed to win users' satisfaction. The results indicate that only two per cent expressed their satisfaction with the work of the government. The government has been unable to promote the vocational aspect of fishermen through encouraging them to sign up to training courses in the field of scientific fishing. In line with PDM, the government has failed to initiate business-friendly reforms and turn indirect support such as educational institutions and investment into human resources. Poor budgetary allocation for infrastructure of the marine fisheries does not encourage investment in the fisheries sector. From the foregoing, Libyan government policies have influenced the entire system of determinants in undermining competitive advantage. At this stage, this thesis argues that instead of shaping the direction of the influence of the determinants, Libyan government has turned out to be a major determinant of competitive advantage (see section 11.2.1 for a detailed discussion and section 11.6 for argument on redesigning the model to reflect current realities of Libya). However, the use of Porter has brought to bear the policies government can follow to establish national advantages (e.g. stimulate innovation, focus on specialised factors, promote domestic demand and firm's rivalry, good infrastructure etc), which can enable fisheries to develop strong competitive position, considering the interrelatedness of the diamond model.

6- Chance Conditions

Volatility in the international oil markets has affected the economies and revenues of all oil-exporting countries, including Libya. Furthermore, United Nations sanctions, far-reaching changes in oil prices, the adverse consequences of the 2008 economic recession and poor political and trade relations with other countries are conditions that have affected the Libyan markets. As Porter noted, these events may provide chances for many competitors to thrive and excel. In the current situation, a new chance has arisen for the government to undertake reforms to develop fisheries in this period of

Libya's post-conflict socio-economic and political reconstruction. In addition, a growing population and changing eating habits are likely to increase demand for fish and change consumers' attitudes towards fish consumption. These chances can play an important role in shifting competitive advantage to fisheries. So far, the PDM has been a useful tool to understanding to a large extent, the areas that provide support, and the weakness that should be reinforced in making fisheries competitive and a sector for diversifying the Libyan economy.

11.2 Discussion of the Research Findings

This section discusses the application of PDM in the context of Libyan fisheries, with specific examples drawn from the case study, neighbouring countries, MENA and the world at large. The arguments presented on the course of the discussion are based on the analysis in the previous sections.

11.2.1 The Role of Government

According to authors such as Auty (2003), Karl (2005), Humphreys (2005) and Hammond (2011), the government play crucial role in enhancing the positive consequences and/or minimising the adverse effects of oil sector upon the non-oil sectors. In the context of the Libyan economy, government has over the years played a positive role towards oil but intervention in the fisheries sector is not positive in many ways. Evidence examined suggests that the role of government in Libya is overbearing and has distorted the policies that should develop the fisheries sector: this is a fundamental failure of the government. Bakan and Doğan (2012) believe that government improves or damages national competitive advantage. That is why in his diamond model Porter denies government a direct role in creating competitive advantage. This study has clearly shown that revenues from oil produced the usual rentier effect on the economy of Libya: over-centralisation of economic power in the hands of an elite few, Dutch Disease, an undiversified economy, inconsistent and unstable regulation and institutions, a high level of inefficiency, nepotism and corruption. These negative impacts were heightened even further by state ownership or near complete state intervention in all sectors of the economy; this dominated agriculture, manufacturing, tourism, trade, banking and insurance, as well as major services such as health and education. While the government is the only body which is responsible for the design of economic development policies for all these sectors, it is also a direct player through ownership or an indirect player through subsidies and the provision of loan. The private sector was weakened and unable to contradict or challenge the economic policies of government.

The efficiency and overall quality of government services and participation in the fisheries sector are inadequate. Individuals are barred from participation in influencing government and public agencies and from helping to shape public policy to their material advantage - so not even feedback is sought from those in the fishing business. This point was raised by participant 102, a fisherman:

> The government does not want to hear from the fishermen or listen to their opinions; the government should do so because the fishermen are the ones who know everything; what the government writes on paper does not reflect the reality of the fisheries sector.

In line with the above submission, Porter and Yergin (2006) earlier stated that "economic strategies driven by the central government alone are not sufficient, because a central government cannot understand and control all the complex elements of the microeconomic business environment that affect company productivity". For example, port infrastructure is one of the pillars of enhancing productivity in the fisheries sector; the strengthening of port infrastructure to ensure its development and effectiveness would require the collaborative effort of all stakeholders in fisheries. The findings showed, for instance, that the port of Sousse had been repaired by the government in the 2000s, but apparently this maintenance was not performed by professionals and did not meet the required minimum standard. For example, participant 58 noted that:

> The entrance of the port is dangerous and the port is not valid for business.

The above disclosures by respondents and documentary evidence show that the Libyan government's sporadic, direct intervention in all sectors or aspects of fisheries suffered from weakness of regulation and control - which has over the years led to lack of will and commitment - and consequently undermines the performance of fisheries relative to fish factor endowment.

International experience indicates that government control of economic sectors and reliance on state-owned enterprises to create economic growth cannot be a sustainable substitute for private sector investment. For example, Libya particularly has not been able to expose its own firms and enterprises to real competition, except, notably, the state-owned oil and gas company, because that is where the country's wealth comes from. In developed economies, the private sector has been central in all aspects of the economy for a long period of time. According to Porter and Chi Minh (2008), both private and public sector have played different but interrelated roles in creating a productive economy in these countries. However, the Libyan government has strangled private sector development, thus undercutting the development of a more vibrant private sector. The muscling out of the private sector is probably to protect government interest because private sector power and resources to develop the sector is viewed as a threat. Respondents envisaged economic liberalisation in which government loosened its control of fishing and they expect greater private sector participation. For instance, participant 90 stressed that:

> Government does not give fishermen the opportunity to deal with companies competent to provide their needs; the government controls import and deals with companies, for example, boats are imported from some companies that not efficient enough.

In addition, Libya faces many challenges at the macroeconomic level; the discussion in chapters two and three explained that the negative impact of the flow of oil revenues was evident in the low contribution made to agriculture, forestry and fisheries and their low productivity to the gross national product. This is a classic symptom of the Dutch disease and the resource curse, which both explain the decay of the role of non-oil sectors in terms of oil's dominance and signal the weakness of governmental policies or government failure to implement policies that will achieve a balanced spatial development (see Auty, 1993). Furthermore, the discussion in chapter three showed that the government uses oil revenue to finance the development plans of all sectors. The availability of huge revenues from oil in conjunction with the weakness of policies and the ineffective implementation of plans led to a weak contribution from non-oil sectors to GDP. Porter (1998) in his theory of competitive advantage stressed that the role of government should not be limited to the distribution of wealth, but should work to create enabling conditions, which are needed to create competitiveness. For example, expert ECM reinforced this point:

> The economy of Libya is dominated by the oil sector. In this context, agriculture and fisheries sectors' contribution to the overall economy of the country has remained relatively weak in recent decades i.e. inferior to less than five per cent in terms of GDP contribution.

Furthermore, the Libya government has all the symptoms of Dutch disease – there are deficient manufacturing or primary industries because the government development agenda and concept of growth has mainly focused on developing capital-intensive industries related to the upstream and downstream sectors of oil production. Unlike fishing, tourism, agriculture, construction or manufacturing, that could lead to diversification, these petroleum economies, which are otherwise 'enclaves' have limited backward and forward linkages with the rest of the economy, and do not generate much employment for the domestic workforce (e.g. the energy sector contributes over half of Libya's GDP but employs only three per cent of the formal workforce) (see chapter three). Sustainable growth requires internal reforms to boost all productive sectors and promote economic freedom where both private and public enterprises can compete in the market.

According to Porter and Chi Minh (2008), a nation's competitiveness depends on the prevailing productive investment environment for business to thrive and create wealth. For instance, the laws and regulations governing any industry or sector have a great role in the success of policies and implementation of plans in the industry. However, it seems that the laws and regulations established for the conduct of the fishing industry and marine resources in Libya impede the development of this sector. The opinions of fishermen, as well as those of state officials and experts who participated in the field study confirmed that the laws and regulations of the fishing and marine wealth sector are generally unsatisfactory. For instance, EMC stated that:

> Fisheries legislation (Law 14 of 1989) is considered by many as obsolete. There is a strong need for updating or enacting new laws, so as to support the future fishery policy and to integrate the major international developments into fisheries management.

Another example of the dominance of government (public sector) can be seen in export. The policy adopted by the Libyan government in 2009 to prevent the export of fish reflects the extent to which the central authority controls decision making without involving stakeholders. It is against this background that it is possible to understand why local fish markets are small and underdeveloped and why other aspects of the fish channel are poor and not strong enough to receive large amounts of fish. For example, RF2 states that:

> The decisions of the state led to poor marketing processes, although we started to export fish during the years 1990-1996. However, the Libyan government

> issued some decisions that made fish export impossible; they only allowed a limited class of fish to be exported, and after that the government totally prevented fish export.

The seeming lack of attention to private sector fishing has been described as one of the effects which occur in authoritarian nations which suffer from the resource curse (see section 2.2.3). Porter (1998:80) states that: "the private sector role in factor creation is necessary to attain factor advantage in most industries". Indeed, it is the private sector (professionals, merchants and associations) that conducts the day-to-day running of the fisheries sector, and it is this sector that makes an appearance, both in terms of production and marketing. However, it has not received enough support from the government to establish a strong industry. For example, RF1 states that:

> Government should support the private sector. The private sector, despite the weakness of its potential and its dependence on old, primitive methods was able to create a local market in its entirety, based on the method of supply and demand.

The discussion in chapters two and three showed that Libya faces many challenges at the macroeconomic level; political and economic stability are vital to achieving economic development and in creating competitiveness in industries. The findings showed that Libyan government strategies constantly change as they depend on international oil prices, which affects the economic stability of the state. In addition, like other resource-rich developing countries, Libya suffers from conflicting political and economic decisions and a lack of institutional stability. Libya does not currently have a stable polity, or at least, it does not have functional arms of government or the institutions of an established country (Anderson, 2011). The government uses oil revenue to finance the development plans for all sectors. The availability of huge revenues from oil in conjunction with the weakness of policies and the ineffective implementation of the plans led to the non-oil sectors' weak contribution to GDP. This is because of their low productivity, which is reflected in the so-called 'Dutch disease' and 'the resource curse' (see chapter two). This calls for a rethink about the role of governments in the diamond model.

There are debates about the role of government in Porter's diamond model. Porter, in his of theory competitive advantage, stressed that the significant role government played should be indirect, and that its part in national competitive advantage was in influencing the four determinants to fulfil their potential (Porter, 1998:126-127). However, for example, Bosch and Pieter (1994) drew a comparison between the viewpoint of Porter

(1985) and that of Best (1990) on the role of government in the success of industries. Porter claims that immediately after the war the role of the Ministry of Commerce in Japan was not direct, while Best (1990) found that the ministry had a great impact on Japan industries. In this regard, Van den Bosch and Pieter de Man (1994) stated that Porter has undermined the role of the re-structuring of policy by the ministry, which has worked until today and perhaps the re-structuring policy lies at the centre of Japanese industries' competitive advantage. The second example is that of the tile industry in Italy, where central government seems absent but local government plays strong role. Best (1990) took local governance as a starting point. Therefore, while Porter (1998:126-127) argued that government can only create competitive advantage through influencing the four determinants in the diamond model. Bosch and Pieter de Man (1994), and Stopford and Strange (1991) counteracted that argument in favour of government being treated as the fifth factor instead of being recognised as a merely exogenous factor.

In the same context, Chang (2003:3) claims "that in the presence of more developed countries, backward countries cannot develop new industries without state intervention''. However, Porter does not encourage the traditional ways of government support to economies and industries such as in devaluation, deregulation, subsidy, privatisation and taxation (Bosch and Pieter, 1994). He points out that this kind of competitive advantage is short-lived. If they were to employ the PDM, many governments would face many unintended policy consequences (Van den Bosch and Pieter de Man, 1994). Indeed, development and economic progress need government support and this requires a long period of time. The developed economies with far greater competitive advantage did not reach this point without adopting protectionist policies for their industries in the early stages of development. According to Chang (2003:10), "Infant industry promotion has been the key to the development of most nations, preventing the developing countries from adopting these policies constitutes a serious constraint on their capacity to generate economic development''. Therefore, oil-rich developing countries still need direct but positive intervention from government at both macroeconomic and microeconomic levels. The countries rich in resources have a particular advantage, which is oil income. In ideal resource rich countries like Norway, the revenue from oil is imperatively used in developing non-oil sectors, building strong institutions and a vibrant infrastructure to support and sustain long-term economic growth and development. The findings of the study indicated that although participants support the need for the private sector, they also expect a strong and *positive* role from the government to develop the fisheries sector. For example, FR1 state that:

> Government should support the wholesalers and retailers, and provide transportation and conservation at a price which is good and suitable for them.

Government can also promote conditions which create incentives for private investment in fisheries and, as Porter suggests, facilitate the development of private organisations and public-private partnerships to advance common goals for the fishing industry. Libya, like most countries, might not be able to significantly increase its wild fishery catches, but it can increase the value from this resources, domesticate international standards and seek investment. Foreign or local investment, for instance, can only happen with good fisheries management ensuring resource supply, favourable investment conditions and an adequate infrastructure to support all aspects of the fisheries business chain. Figure 10.1 is an example of the competitiveness derived from the fisheries industry.

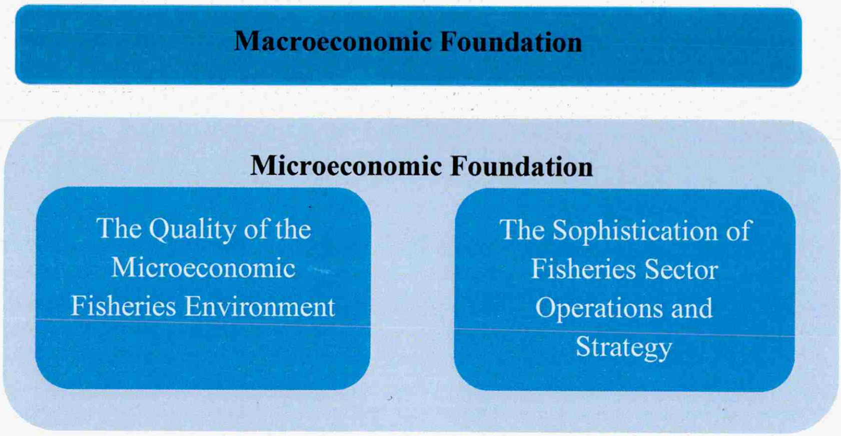
Macroeconomic Foundation
Microeconomic Foundation
The Quality of the Microeconomic Fisheries Environment
The Sophistication of Fisheries Sector Operations and Strategy

Figure 11.1: Determinants of Competitiveness.
Source: Adapted from Porter and Yergin, National Economic Strategy (2006).

From the previous discussion it can be seen that the fisheries sector is weak and requires the government enact legislation to protect the sector and help it to kick start. The role of government should be determined by several factors, including, for instance, economic structures, current phase of the industry, institutions, national values, culture, and histories as well as the financial situation of the state, all of which contribute to competitive success. In the case of the Libyan economy, the government's role should be directed at and centred on transferring the fisheries industries from a factor-driven sector to an investment-driven sector (see figure 11.2 below), and finally, to becoming an innovation-driven economy, as competition is shifting towards the creation and assimilation of knowledge.

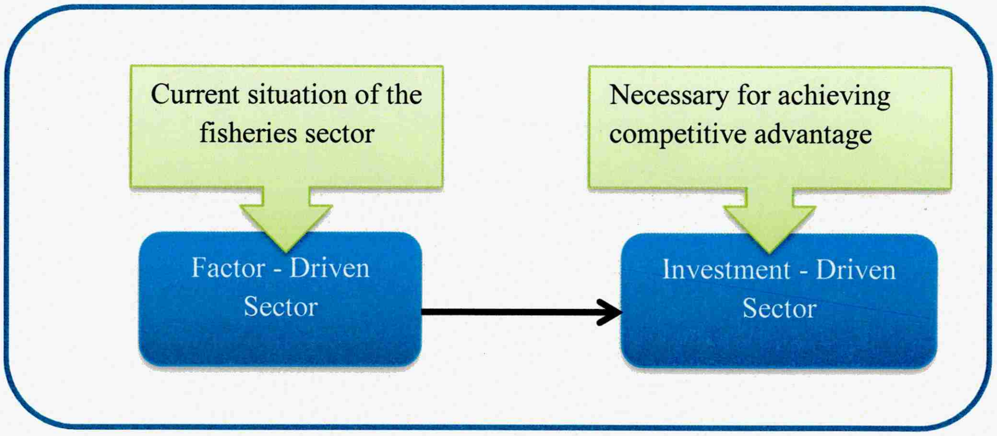
Current situation of the fisheries sector
Necessary for achieving competitive advantage
Factor - Driven Sector
Investment - Driven Sector

Figure 11.2: Libyan fisheries sector development.

Finally, as in many countries where the government is playing an overwhelming role, in Libya the pressing challenge in the post-2011 revolution period is economic reconstruction which will provide adequate regulation or to adopt an economic model that changes the negative governmental role (e.g. from owner-operator to administrator-regulator and partnership) into one that benefits private enterprises and overall domestic competition. It has been established that centralised and often uncontrolled inflows of oil incomes have been at the heart of what fuelled state patronage. However, incoming government could utilise crude income to improve productivity and increase capital available for non-oil sector development (such as that for agricultural sectors), by increasing or changing the composition of state investment in human resource, institutions, infrastructure and technology education in sectors that are most critical for any future economic reforms (see, for example, Morrison and Schwartz, 1996; Stijns, 2001b Barnett and Ossowski, 2002; Davis et al., 2003; Gylfason and Zoega, 2002; Collier et al., 2009; Brahmbhatt et al., 2010). Eventually, non-oil sectors competitiveness improves. Not to be overly optimistic, any attempted structural reforms will possibly lead to an increase in the demand for labour, and hence reduce unemployment but it can also be met by fierce opposition from those who enjoy the *status quo* and dispute may arise over what kind of institutional expression this reform should assume. Overall, the ability to take into account those areas of weak competitive advantage and promote those areas of strong competitive advantage, together with some protectionist measures, are crucial in achieving economic success in fisheries.

11.2.2 Factor Conditions

One of the objectives of this study is to explore production factors, otherwise known as 'factor conditions', and their potential to achieve a competitive advantage in fisheries sector in light of Porter's diamond model by determining its strengths and weaknesses. These factors (favourable location, available fish stocks and the degree of contamination, human resources and infrastructure) are explained in this section.

a) Favourable Location, Fish Stocks and Degrees of Contamination in Libyan Waters

Porter (1998:77) states that "Basic factors remain important in extractive or agriculture based industries". Regarding fish production and trade, Libya has a locational advantage. "Libya has many outstanding assets that are not fully engaged in its economy one of them its location" (Porter and Yergin, 2006). The geographical strategic location of Libya played an important role in the transfer of civilisations to Libya in an early era. The Mediterranean Sea served communications and trade as well as proving the cradle of democracy and the welfare state (FAO, 2003). Whilst technological advances have diminished the role of the geographical location of states in general, the location of a country can still be a source of national wealth, and it thus merits attention, especially if a country's location allows it to control lines of communication and trade whether onshore or offshore. The development plan of the Libyan marine sector (2006-2010) indicated that Libya's strategic location strengthens its proximity to the major markets in Europe and the rest of the Arabian countries (National Foundation for Maritime Investment, 2005:2). Porter (1998:77) observes that "location, relative to other nations that are suppliers or markets, affects transportation cost and the ease of culture and business interchange". He adds (1998:318) that Switzerland, despite its few natural resources, has one natural factor of historical importance: its location. Centrally located on major European trade routes, it has become a trading, commercial and financial centre. This advantage has given Switzerland its strong position in trading and textile manufacturing, which still prevails to date (Porter, 1998). These same factors can also be associated with the historical development of Libya as a centre of civilisation and as a trans-Saharan trade route.

Porter (1998:37) outlined that the two types of competitive advantage that can be owned by a firm are: lower costs and differentiation; both of which may be enhanced by geographical location. It should be pointed out that Libya's geography offers great opportunity. It is close to potential international markets for its goods and services, and to import markets for cheap labour – thus providing transit-trade cluster (Porter and Yergin, 2006). Exploitation of proximity to the European market could enable the country to benefit not only from international trade but also from the market's expertise in terms of trade and investment in the field of marine wealth. This proximity could, furthermore, be key in reducing the cost of transportation of fish whether during export or import compared to other countries dealing with the fish trade. Libya's central location between countries of strategic markets characterised by large consumption of fish, both Arabian (such as Tunisia, Egypt and Morocco), and Europeans (such as Italy and Spain) markets could also be exploited. This location could also link many other African and European countries in terms of international fish trade. However, significant investment would be required to develop this cluster in the highly competitive Mediterranean environment, despite Libya's geographical advantage.

With respect to fish stocks and degrees of contamination in Libyan waters, an over-exploited fish stock is an issue of concern because the fish industry depends directly on fish stocks, and sustainability is vital to fishery development (see chapter four for more details). Hart (1995) states that the theory of competitive advantage is based upon the firm's relationship to the natural environment; it is "composed of three interconnected strategies: pollution prevention, product stewardship, and sustainable development". The findings show that there are insufficient scientific databases in Libya due to a lack of clear focus on fisheries research. Till date, no recent studies estimating the size of fish stocks can be relied on; the last study was undertaken almost 11 years ago, in 2003, and the survey was of only five days duration, an insufficient length of time in which to estimate the fish stock (Development plan of Libyan Marine Sector, 2006-2010; National Foundation for Maritime Investment, 2005:11). EMC stressed this point:

> The fisheries sector is currently characterised by a weak framework for fisheries management (e.g. poor data collection, lack of scientific knowledge on marine environment and fish stocks).

The development plan of the Libyan marine sector (2006-2010) estimated that Libya, as one of the producing countries of the Mediterranean basin, could catch 75-100 thousand tonnes without any negative impact on fish stocks (National Foundation for Maritime Investment, 2005:) This amount of catch gives Libya the opportunity to increase its investment and thus its production.

Furthermore, EMC states that:

> With about 2000 km of coastline, Libya is rather well endowed with marine fish resources. Most of the resources are moderately exploited and it is believed that there would be room for further development particularly for coastal artisanal fisheries and deep water fishery, especially as Libya has recently extended its fishing area to 60 miles beyond its territorial waters.

According to Charles and Herrera (1994), "developing the region typically faces a trio of key problems; over-exploited stocks, an over-extended fleet, and a lack of alternative employment outside fishing". Hence it is imperative to have reliable data sources prior to embarking on the production process; these must be established on the basis of sound economic and environmental factors. Furthermore, although Al arifi (2008) indicted that there are some sources of pollution on the coastline of the eastern region (see chapter eight section B), as expressed by fish retailers (FR2) and government representatives (GR1) interviewed, Libyan waters are characterised by low degrees of contamination. In general, according to FAO (2001), it is areas on the coast of the north-western region of the Mediterranean that are most affected by pollution, because of the urban population and the focus of industrial activities. However, the coast of North Africa, on which Libya is located, is characterised by less manufacturing and construction. Thus, the pressures on the marine environment vary greatly depending on the local and regional level situation. The findings showed that there is no up-to-date or sufficient information about pollution on the eastern coast of Libya. Statistics, data and information are elements essential to any development planning, and without these, the state's efforts to secure future development and welfare of its citizens cannot be realised (Hakim, 2007).

Porter (1998:80) states that "the factor-creating mechanisms in a nation are more important to competitive advantage than the nation's current factor pool". The absence of databases or knowledge is a disadvantage factor; however, depending on the concept of selective factor disadvantage in competitive advantage theory, this could be transformed into a source of advantage by activating the role of research centres at universities and government institutions. For example, Omar Mukhtar University, located in the area study, has a unit specialising in marine environment research in its Marine Resources Department, which should operate in collaboration with the Research Centre of Marine Biology in Tripoli. As Figure 11.3 depicts, running such a research centre produces expertise in this field, in line with what Porter termed 'factor creation'.

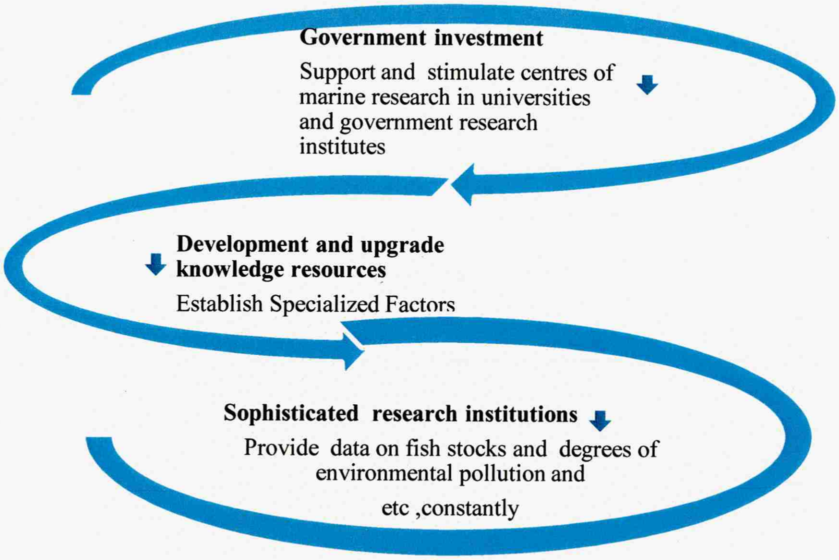
Government investment
Support and stimulate centres of marine research in universities and government research institutes
Development and upgrade knowledge resources
Establish Specialized Factors
Sophisticated research institutions
Provide data on fish stocks and degrees of environmental pollution and etc ,constantly

Figure 11.3: Proposed solutions to develop the factor of knowledge resources in the light of PDM.

B) Factors Affecting the Effectiveness of Human Resources' Performance in the Small Scale Fisheries Sector.

According to Sarra et al. (2013), "human capital these days is considered the most important element of competitive advantage in most organizations''. Findings from this study indicate that fisheries human resources in the study area suffer from two major problems. First, there is a labour shortage, and second, there is unskilled labour. The findings showed that 49.5 percent of respondents believed that the dearth of skilled labour is the core problem facing employment in fishing. Apart from government, upgrading to simple technology (such as synthetic twines which increase durability of gear, reduces cost and reduces the arduous task of frequent renewal of netting), can improve efficiency, attract unskilled labour and increase labour force. Nonetheless, many participants demand that the government provide labour in the field of marine fishing. For example, WS1 states that:

> The government should support the sector by providing an opportunity for everyone wanting to work in this area without imposing restrictions on the availability of staff and as an opportunity to attract the necessary labour.

According to Eggert and Greaker (2009), "in most developing countries, there are many vessels and fishermen catch too few fish from too small stocks". However, the findings of this study have shown that even though Libya is termed a developing country, it is for many reasons different from the majority of developing countries. Historically, the occupation of fishing was not popular. According to Reynolds et al. (1995), although Libya has a Mediterranean coastline almost 2000 km long, with an ancient history of human settlement, traditions of fishing and fish consumption are not particularly strong features of the society. However, the demand is currently increasing due to increased welfare and change in eating behaviour. In addition, as the discussion in chapter three showed, another reason for fishing not attracting labour can be traced to oil exploitation. This provided increasing opportunities for people to work in the public sector, subsequently leading to a rural-urban migration of workers. Over the years, massive out-migration towards urban areas has led to profound demographic changes that affect agriculture and fishing; this caused a decrease in the number of people employed in primary food production. Falling profits likewise account for a shrinking fisheries labour force. According to many of the participants, the provision of foreign labour is a logical solution to resolving the crisis of shortage and unskilled labour in the fishing sector, but they confirm this should be carried out under the regulations and standards specified by the state and in line with international conventions. The Libyan government should not make the mistakes made by some other countries whereby cheap foreign skilled labour has had a negative impact on the rate of the productivity of labour.

The findings also indicate that 14.4% of the fishermen were aged 25 or below in the fishing profession – an indication that the Libyan fishing industry is ageing and shows lack of participation of those below the age of 25 years. In addition, the fishermen are not highly skilled - due to the lack of education and vocational training in the field of fishing in the eastern region and no expertise in the use of modern fishing techniques. The result of the educational background of the fishermen shows that when certificates (whether from secondary school or university) are held by fishermen, they have nothing to do with fishing. Porter (1998) argues that this kind of situation does not create a competitive advantage because non-specialist education such as obtaining secondary school and university degrees falls under the heading of basic factors.

The use of technology plays a major role in increasing productivity as well as developing fishermen's skills. Attaining a competitive advantage within the fisheries sector using the power of technology is crucial in the modern world. Technological ingenuity develops new products, causes average variable and fixed cost reduction as output increases, and increases efficiency or adds value. Technology allows customers to easily and conveniently have access to facilities or goods using information technology (De Silva, 2011). The advantages of technology in fisheries were elucidated by FAO (2015:1):

> "Technological development and widespread use of synthetic fibres, hydraulic equipment for gear and fish handling, electronics for fish finding, satellite-based technology for navigation and communications, on-board conservation and increased use of outboard engines have all contributed to the major expansion of fisheries and aquaculture in recent decades - particularly in small-scale fisheries".

The level of technology is represented in this study by the extent to which fishermen use devices and modern equipment in fishing operations. Fishing in the eastern region of Libya could be described as very traditional both in terms of its fishing operations and its methods of sorting and keeping production. Less than one third of fishermen interviewed or questioned have never used new technology in fishing to increase productivity, harvest and to maximise income. Data resources and respondents confirmed that fisheries users do not use modern technology; for example, FAO1 stated that:

> One of the problems that hinder an increase in fish production is the continued use of traditional fishing methods.

The absence of fishing technology has led to negative results such as lower production of fish, reduced access to resources and increased physical labour requirement due to the scarcity of devices that could help fisherman in the discovery of fish populations. The fishermen, however, engage in personal capacity building to compensate for the lack of technology; but in doing so, resort to environmentally unfriendly alternatives such as the use of dynamite. For example, RF2 states that:

> There are some fishermen who use dynamite to fish and this also affects the fish spawning.

This leads to the destruction and in the worst case depletion of marine wealth because dynamite kills small fish and fish eggs. Unfortunately, over a quarter of the study participants use dynamite. According to FAO (2008), "fishing entailing the use of dynamite and poisons can have severe and broad-reaching impacts, particularly on coral reefs". Furthermore, the use of this method breaches international regulations that may delay the opportunity of Libya to extend into global markets and to engage in free trade. In addition, it affects the level and success of investment in this sector, which is the main means of creating competitive advantage. Fishing operations in Libya need to focus on environmentally-friendly fishing processes. The introduction and use of technology such as the ones mentioned by FAO (2015:1) in the study area is crucial if competitive advantage is to be achieved. The use of technology increases fish production, and saves fishermen's efforts and time by enabling them to recognise fish location, to avoid breeding areas and fish spawning reserves and to protected marine life. This helps make fishing not only sustainable but environmentally-friendly. However, the use of technology or technology transfer is necessary but not sufficient; in other words, fishermen and other workers must be able to use those technologies. The government or any interest group should introduce programmes to train and empower them to use this technology.

Human resources play an essential role in innovation, which is the core of competitive advantage theory. Innovation could be through externally-driven technology, which is often imported by the government. Also, fisherman, sellers, and all those involved in the supporting and related industries or at any stage of the value chain are also key sources of innovation. According to Tambo (2014), farmers have been recognised as one of the key sources of innovation and there are calls for strengthening their innovation capacities. Therefore, it is significant to focus on the fishermen and all those involved (directly or indirectly) in the fisheries sector as a vital source of innovation so that they can add value to the services they render, because they are the actors who drive the different activities within the sector. According to the diamond model, highly skilled labour is not inherited but created, and it is one of the sources of competitive advantage. Therefore, promoting skilled labour and using new technologies are the key factors in adding value to the products. They also increase the quality of the product, and efficiency output increases. Adoption of technology should not just focus on externally-driven innovation through technology's import by government. Learning new methods or modifying old methods--by fisherman, seller, and labour in the supporting and related industries or in any stage of the value chain--are key sources of innovation. Farmers are key sources of innovation and scholars like Tambo (2014) are calling for the strengthening of their innovation capacities. Therefore, it is significant to focus on the fishermen as well as sellers as vital source of innovation.

Human resource is one of the major drivers for increased production of fish. For the fishery sector to grow and the fish supply to increase to meet the growing demand, necessitate formulating means and modalities for regular training and for the expansion of a sufficient number of competent people in activities related to the fishery sector, whether these activities are related to production, downstream or distribution. Additional value which is the source of competitive advantage could arise in any of these stages. High-skilled workers with expertise in Porter's diamond model of competitive advantage are classified among the specialised factors. Porter further suggests that the specialised factors, unlike the general factors, are more important and supportive to the sustainable competitive advantage (see section 4.2.1, A). At this point, the government's role varies according to the nature of the state or society of investment in factor-creation (see figure 10.4). The fishing career needs particular education and training from institutes and colleges specialising in the fishing industry.

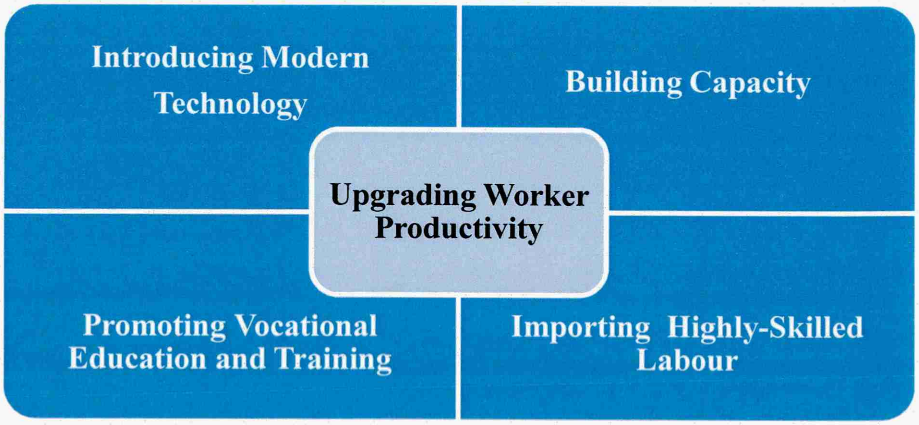
Introducing Modern Technology
Building Capacity
Upgrading Worker Productivity
Promoting Vocational Education and Training
Importing Highly-Skilled Labour

Figure 11.4: Proposed solutions for human Resources in light of Porter's Diamond Model.

c) Infrastructure

Although the Libyan government receives surplus oil revenues, which should be more than enough to develop other economic sectors such as marine wealth, the findings of this study proved that reverse is the case as financial allocation to the fisheries sector is very low. This lack of funding led to poor investment in infrastructure, which is one of the pillars of competitiveness. In 1972-2005, it constituted only 0.55% of the total budget allocation plans in Libyan economic and social development (National Agency for Marine Investment, 2005: 3). The current state of ports infrastructure and the domestic market are weak. These two important factors constitute the main barriers to achieving competitive advantage because they reduces the sector's capacity to attract investments, and by no means reduces quality standards, which can delay obtaining permission to enter into international trade. The African Development Bank Group (2013) stated that competitiveness is higher in countries with an adequate supply of infrastructure. This also applies to infrastructure for the fisheries sector. The findings of this study show that the infrastructure of fishing harbours suffers many problems. In addition, many of the participants in the study pointed to the weakness in the existing infrastructure of some of the fishing ports. For instance, FAO1 observed that:

> Landing zones are well equipped, even if they are, the equipments are obsolete and disorganised, and thus unable to receive the quantities of fish being caught in a healthy manner.

This shows that even though the state manages the ports, maintenance does not seem to be carried out by specialised personnel. For instance, participant 90, a fisherman, commented:

> The entrance of Sousse's port was narrowed during maintenance, and now at high tide some types of boats are unable to enter the port.

The fishery in the study area needs a considerable development of infrastructure. Fisheries infrastructure directly or indirectly affects the efficiency of human resources and the productivity of the fishing boats, and thus impacts on the process of production and marketing. Directing investments to establish modern infrastructure, whether in the harbour or ports or transport and marketing, will build foundations for the development of the fisheries sector because there are international standards that must be met in the infrastructure of fishing ports. Such projects, through the construction of roads, lines and means of transmission and distribution suitable for the fish, will increase the quality of the final product. More importantly, this will allow Libya to enter into international fish trade agreements, thus making the fishery sector competitive. In addition, competitive advantage can be achieved through the supply chain mechanism. However, findings show that the supply channels are random in the fish market; the supply and distribution systems are uncoordinated and inefficient. There is no particular system for the flow of fish from the fishermen to the consumer.

Many studies emphasised the vital role of infrastructure investment in promoting economic development (Sahoo and Dash, 2009; 2012; Estache, 2006; Calderon and Serven, 2003). According to the World Bank (1994), infrastructure represents, if not the engine, then the 'wheels' of economic activity. The relationship between infrastructure and economic growth has, in recent years, become one of the most important economic topics in both academic and policy circles (Fedderke and Garlick, 2008). The focus on infrastructure should be to provide broad, general benefit to the entire fisheries sector (and beyond), that which private businesses do not provide, for example, harbours, roads, transportation to internal and external markets, and reliable utilities (electricity, water, etc.) needed for processing and refrigeration. It should also be recognised that the most important infrastructure for fisheries development is not necessarily at the coast; it includes transportation infrastructure that allows products to reach the market for the final consumer (Knapp, 2013). Figure, 10.5 is a demonstration of the possible scenario for solving the problems of fisheries infrastructure.

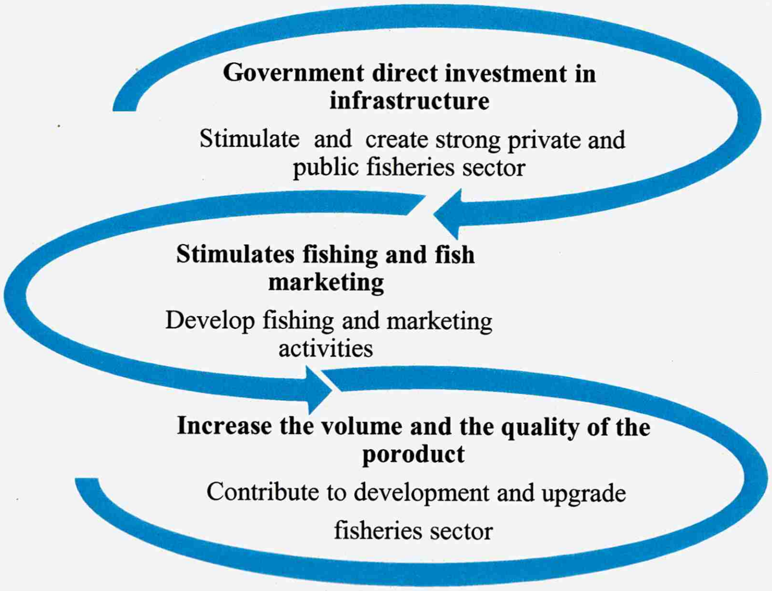
Government direct investment in infrastructure
Stimulate and create strong private and public fisheries sector
Stimulates fishing and fish marketing
Develop fishing and marketing activities
Increase the volume and the quality of the poroduct
Contribute to development and upgrade fisheries sector

Figure 11.5: Proposed solutions for infrastructure in light of PDM.

Developed countries such as Japan usually pay significant attention to fishing ports infrastructure to promote fishing business. For example, Makino (2011:12) notes that "the fisheries infrastructure is important for establishing the stable provision of fisheries products to the Japanese citizens and for ensuring the development of the fishing industry." Libya does not pay enough attention to developing the potential contribution of the private sector's establishment of infrastructure. For example, there is low funding in terms of granting loans to fishermen where 47.7% of respondents said that loans are not widely available, scarce and inaccessible. Furthermore, there are several constraints that govern investment in the fisheries sector, and they are multiple and interrelated as described by FAO1, GR1, FM1, FM2, FR1, EMC, and the development plan of the Libyan marine sector 2006-2010 (see list of abbreviations in chapter eight). For instance, the Libyan government did not develop suitable policies, such as legislation that enhances local or foreign investment. The lack of adequate legislation and access to credit is considered a barrier to providing the right environment to investment. Furthermore, the absence of the right regulations deters or discourages private-investor investment, whether foreign or local. In Libya, local entrepreneurs neither enjoy protection nor have the active support of the government (Porter and Yergin, 2006).

11.2.3 Demand Conditions

According to the diamond model, if competitive advantage is to be achieved by domestic demand, it needs to be characterised by two features: sophisticated and anticipatory buyers making the size of the home market of only secondary importance. The findings reported in sections 9.1- 9.2 show that domestic demand for fish is small and that fish demand does not seem to be a source of competitive advantage even with good conditions. The narrative of both production and consumption in the eastern region of Libya indicates that neither the former nor the latter is sufficiently strongly motivated to create a competitive advantage. Coincidentally, Libya suffers from a food security problem. According to facts presented in 3.2 and FAO (2011:8) estimates, Libya imports 80% of its food consumption requirements. Instead of adopting the traditional export-led growth model on fisheries, the competitive advantage theory appears well placed in utilising the plentiful fish resources base for economic growth and in reducing Libya's food security problem. In this context, there is a need to fully coordinate what is put on the level of the overall economy with how it is executed at the microeconomic level. For example, in developed countries such as Australia, the seafood industry was designed to fit with the country's food plan (South Australian Seafood Industry Food Plan, 2009). Other lessons can be drawn from the analysis of those countries that had significant economic success with food security. In addition to learning from success stories of countries, Porter's model is well structured to grow local demand. When customers demand high quality fish and a unique experience, coupled with a reasonable price, the PDM places priority in increasing production and product standard, promote eating habits, and in particular reference to Libya, to support food security.

According to Myrland (2000), understanding the decision-making processes of buyers of seafood is important for vendors if they are to meet customer needs and increase the value of their products. This is particularly true with increasing campaigns for healthy eating coupled with affordability and the rising standard of living in Libya. According to Porter (1998:86), "while home demand, through its influence on economies of scale, can confer static efficiencies, its far more important influence is dynamic. It shapes the rate and character of improvement and innovation by a nation's firms". The findings of this study show that the percentage of consumers who eat fresh fish more than 3-4 times per month is very small in the eastern region of Libya. However, the majority of respondents consume tinned seafood, such as tuna and sardines. This had been anticipated by the researcher as tuna is a long time staple and the most commonly consumed seafood in the Libyan diet. This may be due to the relatively low price of tinned seafood making it affordable to most income levels; it is healthy and has good flavour. This means that the majority of participants in the study do not reject the consumption of sea products, but there are reasons limiting their consumption (as will be seen below), and subsequently undermines the demand factor determinants for the sector.

The key to achieving competitive advantage by local demand is to know consumers' requirements. According to a critical realism approach (see chapter seven), which was adopted in analysing the data in this study, social and natural reality should be understood as an open layers system of objects with causal force. In this case, the factors that affect fish demand and consumer needs should be understood because they make up the structure of domestic demand for fish. This was achieved by applying Shepherd's (1985) model and the logistic regression model (see chapter seven), which allowed explication of the factors that affect the nature of the buyers' needs in relation to fish consumption. The findings reveal that there are many reasons preventing participants from buying fish. First, the price is an issue compared to other type of protein such as chicken, beef, and lamb. Fish is second place in terms of preference after lamb. Therefore, even if many consumers have a desire to buy fish, high prices prevent them. Consumption of chicken is the highest compared with other proteins because the price of chicken is reasonably cheaper than fish. This finding corroborates similar research conducted by Olsen (2004) and Honkanena and Frewerb (2009) on the effect of price on protein consumption. However, this finding contradicts some other studies, which found out that price was not a barrier (e.g. Honkanen et al, 1998; Leek et al., 2000). In addition, Professor McKenzie (1979:7) found that "price and income has an influence on food choice but only of a limited and crude nature."

Fish is an important source of animal protein, minerals and micronutrients to over 400 million Africans (Heck and Béné, 2005). Paradoxically, despite the high dependence on fish protein in Africa, fish consumption in Libya is one of the lowest in Northern Africa, with an estimated only between five and seven per cent of the population eating fish

(WorldFish Centre, 2009). In contrast, fish is a traditional and important component of the Egyptian diet, and the main source of cheap animal protein for the country's growing population. Curiously, despite Libya's location on a long coast of approximately 2000 km, fresh fish is not a common food, and because of its high price, it is perceived to be a luxury source of protein. In addition, as the size of the average Libyan family is large, and the cost of fish is high, a family will need to spend far more to provide one meal of fish compared with a chicken or beef meal. Prices in the local market are linked to the high cost of equipment; the fishermen are exploited by wholesalers because they provide the fishermen with supplies of ice to keep the fish in a fresh condition, along with salt, boxes, bait and transportation, in return for which they control and determine the price of fish species. All these factors of production costs are ultimately passed onto the consumer. In addition, the findings from the study show that the state did not control the price of fish in anyway, and this has placed fish out of the reach of many consumers, in spite of its high nutritional value. Andreyeva et al. (2010) argue that: "in the light of proposals to improve diets by shifting food prices, it is important to understand how price changes affect demand for various foods, meats being most responsive to price changes" Likewise, French (2003:841S) points out that:

> Food pricing and marketing practices are therefore an essential component of the eating environment. Recent studies have applied economic theories to changing price. There are two main sources of economic instability, namely exogenous shocks and inappropriate behaviour. Price reduction strategies promote the choice of targeted foods by lowering their cost relative to alternative food choices.

The findings show that there is a relationship between frequency of fish consumption, income and size of a family, as supported by Jensen and Manrique (1998), Manrique and Jensen (2001), Verbeke and Vackier (2005) and Wan and Wuyang (2012). However, these contrasts studies claiming that income has no direct role, or plays a secondary role, in explaining the frequency of seafood purchases (see, for example, Herrmann et al., 1994; Myrlanda 2000). Also, as regards family size, this finding contradicts studies such as Amsat (2011). Furthermore, the age of the head of the household is one of the factors that explains the frequency of fish consumption, a finding that is supported by Erdoğan et al (2011), Olsen (2003), Myrlanda (2000), Nayga and Capps (1995) and Herrmann et al. (1994).

Secondly, insufficient fish markets, especially near residential neighbourhoods, account for low fish consumption in the study area. This drives consumers to look for alternative goods such as chicken, lamb or beef, which are widely available. The findings suggest the possible importance of small neighbourhood fish markets and availability of fresh fish shops selling at a discounted rate. In addition, the impact of customs and traditions cannot be overlooked regarding food choice. Dietary habits are an integral part of the customs and traditions of any society. Culture, which includes customs and traditions, has a profound effect on the dietary habits of any community. Despite the fact that Libya is a state with a long Mediterranean coastline, the Libyan diet has never been linked to fish consumption, as people preferred to eat red meat (beef or lamb), as it was the only type available to them. This can be traced to the Libyans originally being Bedouin tribe and having a closer relationship to the Sahara than to the sea. Culture's effect on the nature of consumption in society has been documented and the findings from this research support the arguments of Shepherd (1985), Grivetti (1997), Kittler and Sucher (1989) Rimal (2002). Culture accounted for the difference in levels of fish consumption among cities in the study, where findings show significant divergence in fish consumption between the four cities. However, this was not in terms of geographical location (coastline and inland), which contradicts Rimal (2002). In terms of frequency of fish consumption, Tobruk came in first place; this might be attributed to the fact that Tobruk is very close to the Egyptian border, and fish consumption is common in Egypt, at an estimated 16 kg/per capita (Badwei, 2012). Al arifi (2008) reported that another rationale behind this high rate of fish consumption might be because many housewives who are originally from Egypt would prefer a meal of fish than would beef or lamb.

Changes in food supply can affect eating habits, as in the case of chicken consumption which in Libya was not common in the past and whose consumption was linked to the poor. The poultry industry was able to overcome a number of barriers and made positive influence towards the change in Libyan food habits, which has now made chicken one of their main diet (see chapter nine). As prices fell within the reach of the Libyan citizens, chicken consumption even exceeded lamb.

Convenience in the preparation of a specific type of food stimulates consumers to buy it because they save time, effort and thinking. In the current study, some heads of households explained that fish dishes are not easy to prepare compared to meat; the preparation of fish requires time and effort, and so fish is seldom bought. This supports the relationship established between food choices and convenience observed by Costa et al. (2007), Jaeger et al. (2007). However, Olsen et al. (2007) and Olsen and Rortveit (2009) reputed the claim that the relationship between convenience orientation and fish consumption is indirect. Regarding this case study, the phenomena in recent decades of women going to work outside the home may well be a factor contributing to their reluctance to prepare meals involving fish. In Libya, women are responsible for cooking, housework as well as taking care of the children; accordingly, compounded with work outside home, this might lead them to avoid meals that are time consuming and require too much hassle to prepare. Furthermore, some women are unaware of how to prepare a tasty meal of fish. In such cases, the development of methods of processing, packaging and ready meals of frozen fish will stimulate domestic demand due to ease of cooking. These types of related industries might create a competitive advantage for this sector and thus be a major supporter of the fishing industry. In the developed world, such as Australia, with over 35 years of fully developed fishing industry, the processing sector alone includes processing for domestic consumption, live fish processing for export, including canning operations in specific kinds of fish such as tuna.

Furthermore, prevailing health-related belief that fish consumption has a positive impact on human health affects the decision of the head of the family. Consumers' beliefs about the relationship between diet and health have been shown to influence their behaviour in different levels (see, for example, Pieniak, 2010; Ragaert,et al., 2004; Verbeke and Vackier, 2005; Olsen, 2003). This indicates that belief in the health-giving properties of fish may affect the frequency of fish consumption. Therefore, the knowledge level of home customers about the nutritional value of fish is significant; however, two-thirds of the participants in the study had no knowledge about the nutritional value of fish. One reason behind this might be the lack of mass awareness that helps to widen consumer knowledge as well as stimulate an increase in fish consumption. Awareness about fish consumption can be extended to local restaurants to educate them on how to prepare delicious fish meals.

11.2.4 Context for Fisheries Strategy and Rivalry

In the diamond model, rivalry is of fundamental importance as it is the factor that stimulates industries to develop and upgrade their production. The findings showed that the eastern region of Libya's fishing industry is characterised by weak competition among its fishermen and between fish traders. This may be due to the weakness of the private sector as the types of governments found in oil-rich developing countries or centrally planned economies keep the industry and sectors of the economy under control for fear of the emergence of any strong group that might pull the rug out from under them, even partially. According to Bonney, (2014:1): "countries such as Burma, Cuba, Iran, *Libya*, and North Korea use the Command Economy as their economic system, most of these countries are controlled by a Communist government, which gives the people little or no power over the economic markets". This is one of the manifestations of the resource curse and its impact (see chapter two). Therefore, it is difficult to say that there is competition in the fish market. The researcher attempted to determine the competition in the market by putting a question to an expert at the Marine Research Centre; his response was:

> This question would be logical if you asked it in a country like Britain or America, but not in Libya. Here there is no assessment of the competition between fishermen or traders or even companies.

On the other hand, findings in chapter nine have shown that meat markets (such as chicken and lamb) strongly compete with fish markets in the eastern region. As narrated by El Kaboti (2014), this is due to the attention that poultry received in the early 1980s where latest technical know-how (e.g. in animal feed production, veterinary services, breeding and infrastructure) and motivation to farmers and regulators were offered by the Libyan government. When Ghaddafi abolished and confiscated private ownership in the late eighties, the government built a big poultry project like Tawarga, Alher and Gota Sultan and place them under the management of Dutch and Danish companies. With the Libyan sanction, the private sector was left to continue with some governmental projects. Because growing demand is not coping with supply, the government on its own and the private sector began to import hatching eggs. In subsequent years, to pre 2011 revolution, poultry and meat products were being imported from Turkey, Brazil without taxes on imported meat. Massive importation and local production of poultry products have resulted in lower price offered the consumers. The meat and chicken industry, however, faces challenges, such as lack of water and pasture and the high cost of imported animal feed. The findings of this study demonstrated that even the day-to-day running of the fisheries sector is dominated by the private sector; however, it is very weak; the fishermen and wholesalers and retailers rely almost entirely on themselves.

Porter (1998:117) states that "among the strongest empirical findings from his research is the association between vigorous domestic rivalry and the creation and persistence of competitive advantage in an industry". Without a strong private sector within the fisheries sector, there will be no domestic rivalry. In general, the Libyan economy is to a large extent controlled by the public sector, and private sector investment is very low because the Libyan economy is centrally planned (Bin Guidara, 2010; Sakala and Kolster, 2013). The essence of the diamond model and its mechanisms are absent in features of a centrally planned economy. However, this does not mean that the fisheries sector will be not able to achieve competitive advantage; some studies (such as Simt, 2010; Davies and Ellis, 2000) point out that many international industries are successful despite not having a strong diamond or innovation-driven stage.

As regards policies, those of Libya's previous government are unfavourable to creating and promoting competitive advantage in the fisheries sector. For example, the last plan which this study analysed, entitled, *the development plan of the Libyan marine sector (2006-2010)* (National Foundation for Maritime Investment, 2005, 31-32), set out some objectives of the development plan of marine resources and the strategies proposed in the development plan of marine resources. However, it did not refer to the mechanisms or schedule that was to be applied to achieve these objectives. In addition, many participants emphasised that the laws and regulations related to marine wealth hinder investment and competition in the fisheries sector. For instance, FM1 expressed his opinion:

> The laws related to fishing and the fish trade are totally unsatisfactory and hinder the work of the fishermen.

This has also been shown in the recommendations proposed by many of the participants in the study. For example, FAO1 states that:

> The government should modify some of the investment laws so that they support, reinforce and enable the establishment of complementary industries related to fish products.

To encourage economic growth outside the oil sector, Libyan planners need to help shape a legal framework that promises greater access to finance for small- and medium-sized businesses. They should also "make efforts to further remove the red tape and bureaucratic inertia that have made Libya one of the least attractive countries on earth in which to invest, beyond the oil sector" (Sakala and Kolster, 2013).

Furthermore, because fishermen's cooperative societies are ineffective, they fail to motivate fishermen to participate in teamwork. Most participants in the study are not members of cooperative societies. In countries like Libya, which is characterised by weak government performance, the importance of these cooperatives is vital. Deacon and Ovando (2011:16) state that:

> In countries that suffer from ineffective governance, user-based management can fill voids governments might otherwise occupy. Case studies from around the globe demonstrate that these advantages can be important in practice and indicate that fishery cooperatives deserve increased attention from researchers and policy makers as a management option.

FAO (2012) cited in Ostrom (1990) believes that "communities with successful community-based organizations are better off than those without" In addition, cooperatives in the small-scale fisheries sector maximise long-term community benefits to deal with the threats of fisheries mismanagement and poverty and to sustained livelihood. Cooperatives can act as a safety net against catch shortfalls, sickness and death in the family, natural disasters – such as flood and earthquake - and hunger (FAO, 2012). In addition, the fisheries sector has suffered from continuing institutional and administrative instability over the past four decades where the devolved responsibility for this sector has been devolved eleven times to different government administrative departments.

The Libyan government needs to understand private sector led growth and to allow a new generation of investors to emerge and create fishing firms that are efficient enough to encourage an increase in local demand and export. For this to happen, policy makers must promulgate business-friendly reforms in fishing. Accountability, transparency and service delivery of institutions that interact with firms are identified as factors to drive reforms in the fisheries sector. Similarly, several instances of such successful reforms from similar or neighbouring countries can be borrowed and adopted, including those from Morocco, Mauritius and Tunisia.

11.2.5 Fisheries Related and Supporting Industries

Porter (1998:100) defined related and supporting industries as: "the presence or absence in the nation of supplier industries and related industries that are internationally competitive". Libya has had an agricultural policy in place since 1983, but most of it focused on crop and animal production agriculture without including same attention to fisheries; the failure of this policy to adequately support fishing has led to low annual catch and poor growth of fish-related industries. The findings of this study interestingly show that the Libyan state has established some factories that to an extent do support the fisheries sector. For example, factories to produce inputs such as boats, ice plants and fish canning factories are in place but not sufficiently adequate to service the growing fish industry. Most of these factories do not work and the ones that do work operate inefficiently. It is worth noting that the factories owned by the private sector, whether the fish canning factory or the two factories producing ice, work efficiently, despite the lack of foreign labour and skilled national workforce, the absence of agents who provide the input and the presence of high cost operating requirements. All these problems cause an increase in the cost of output.

The problems influencing the related and supporting industries of fisheries are many. First of all, poor management of public factories, the overlapping of regulations and legislation and the instability of institutional and administrative support to these industries had a negative impact on the implementation of plans and how programme run. Management style and its strategy have a direct impact on competitive advantage. To improve factories' performance, they should be managed according to their objectives and the approaches followed by the factory managers. The competitive advantage which needs to be in place requires full coordination between all of the parties: industry managers and shareholders. Secondly, lack of funding and inadequate investment law show that the fisheries sector, in general, suffers from low financial/budgetary allocations due to weakness of macroeconomic policies and legislation. Investment laws do not encourage domestic or foreign investment. This to a large extent impacts negatively on the suppliers of raw materials where there is an absence of agents to provide input. Intense and sustained investment is a vital artery that feeds the creation of competitive advantage in manufacturing.

The lack of a skilled workforce is a problem found throughout all sectors. Furthermore, private factories face high production costs, which negatively impact on development and the improvement of related and supporting industries in the fisheries sector. Porter (1998:39) states that lower costs allow the firm to gain a competitive advantage. Therefore, the supply of inputs to the factories should be moderated by the government through appropriate legislation and regulations that support existing industries and stimulate the emergence of new competitors; this will stimulate domestic rivalry which is the core of innovation. As a result of lack of infrastructure, fishermen sometimes face the accumulation of production at certain seasons of the year.

Unlike oil production, fisheries backward and forward linkages are likely to have higher multiplier effects through the supply-and-value chain mechanism and the economy in general. As a result of the poorly organised chain of processes in fisheries and lack of support, what Libya ends up with is a sector that neither satisfies the needs of customers – in terms of price, quality, and innovation - nor the needs of its constituents - involvement, benefits, training, safe workplaces, attractive return on investment, profitable growth. There are three interconnected elements that a fishing industry needs to be able to develop and grow in a healthy, productive way. These include the reproductive capacity of the fish as a resource, fishery and the effective use of the catch (Yamaha, Fishery Journal, 1996). Surplus fish can be sent to fish canning factories or utilised after being processed as animal feed or bite. The findings in chapter nine demonstrate that there is a large demand from Libyan consumers for canned sardines and tuna which are imported from foreign producers - the demand which should ordinarily be met by the Libyan fish industry. Investment in supporting and related industries is important for the development of the sector. It works to motivate all participants, both input suppliers and producers, in the production process. It also works as those in charge of industries can create ways to achieve competitive advantage in the fishing industry. Accordingly, if the domestic market is too small, Libya will look further afield, at the external market. Supporting industries and the related fisheries sector should be given great importance because they are considered a strong supporter of the industry.

There is a potential to establish complementary industries because many requirements are needed in the fishing industry. These include ice plants, equipment handling, factories for fish canning and fish preservation, fishmeal and fish oils, among other products such as fish fillets and canned seafood. One of the respondents (FAO1) suggested that:

> For the industry to prosper in the future, it requires financial support for investment, amendment of some investment laws, the opening of channels of internal and external marketing and awareness campaigns directed at the consumer and the producer.

Is Libya ready to abide by the above suggestion in its current political and economic circumstances? The chance is already created as can be seen in the next section.

11.2.6 Chances

Heeks (2006) argued that Porter's model lacks the ability to predict, especially in the light of unexpected events. Also, the dynamism and the inter-relationships between determinants make it difficult to predict how a particular combination of current factors will emerge in the future. Now, Libya stands at a crucial intersection with the ousting of Ghaddafi's government and in a post-conflict reconstruction phase. According to Meijia and Castel (2012), this grasp of event lays an opportunity for radical wealth management strategies that revamps the oil sector to become an agent of equal growth and stability. This is the case in Libya as the on-going structural, democratic and economic changes, brought about by recent events in the country, will inevitably change the paths of the Libyan economy. At this time it remains uncertain what or how the changes will be and their effect on the production processes. As Libya is currently undergoing post-war reconstruction, an opportunity has arisen for a limitless need for expertise in economic and reconstruction. However, the key to reconstruction will be political governance matched by economic reconstruction. For example, Ordu et al. (2011:1) strongly argued that:

> The reconstruction of Libya will need to be both integrated and systemic, interweaving various social, political, legal, and economic initiatives that can help prevent the kind of backsliding that disparate efforts at economic and legal reform or political liberalisation, if made in isolation, often provoke.

In general, a critical factor in economic reconstruction is for the Libyan government to create political and legal stability and create incentives for the processes to happen naturally - by making people want to do them voluntarily. These require investment in physical capital, infrastructure and human capital, and allowing market forces to create the conditions for the market to work.

The recent increases in the international prices of crude oil, the implied windfall gains, and the potential macroeconomic volatility that reliance on oil can introduce in the economy, present Libya with the chance to devise means that reduce the instability associated with the price of oil and by extension its impact on fiscal policy. The economic policies of the Libyan government in the wake of the sharp rise in oil prices prior to the 2008 economic crisis, proved even more destructive to the rest of the economy. Other chances that create opportunities for diversifying to fisheries - and by so doing could increase the competitiveness of the sector - include natural increase in population growth and rising migrants from neighbouring countries who already consume fish as part of their diet. It has also been established that fish consumption in Libya is influenced by many factors, among them economic and market considerations (e.g. cost and availability) as well as culture and tradition, taste and access to alternative foods such as chicken and meat. These factors, constraining demand conditions for local fish consumption, are likely to change as awareness about the nutritional benefit of fish consumption grows. This is possible only if sufficient fish supplies are available to meet any eventual increase in demand.

11.3 Summary

As shown in various sections of the thesis, it has been clear that Porter's model has proven suitable for the development of the fisheries sector in the Libyan economy because the six determinants have provided the opportunity for assessing all the factors affecting fisheries development. The research findings have also shown that government has contributed in great extent to the current situation of the fisheries in Libya. The Libyan government has consistently influenced (directly or indirectly) each of the four determinants in both positive and negative ways. As a result of the findings in Libya - a resource-rich developing country bedevilled with the resource curse – the model needs some adjustment to factor in the crucial role of government that is required at this stage of fisheries development. Figure 11.6 presents a modification and an alternative to the original diamond model. Based on the findings from this model, suggestions for policy making were made because of the active role government plays in both economic and industrial development, especially as Libya is undergoing structural reforms and strategy nowadays.

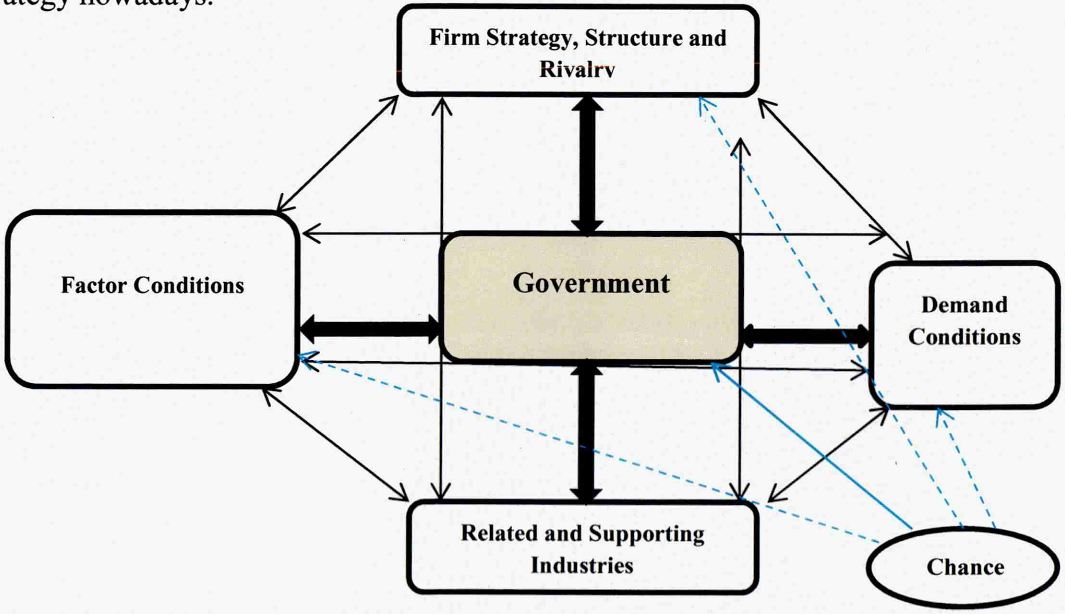
Firm Strategy, Structure and Rivalry
Factor Conditions
Government
Demand Conditions
Related and Supporting Industries
Chance

Figure 11.6: Modification of Porter's Diamond Model for fisheries in the Libyan context.

The role of government in PDM is an indirect variable which has an indirect impact, as an external determinant. However, in the Libyan fisheries sector the government role should be positive, direct and central. There are a number of reasons why: the industry is still a novice and the fisheries sector still needs to be taken care of, and be supported directly by the government. One could argue that the extraordinary weakness of government institutions and the dearth of social programmes make it less likely that the government will apply any different approach in the fisheries sector. However, some protective measures need to be in place to strengthen and enhance the activity of fishermen and fish traders (for example, in price policy, buying some of their produce, raising taxes on imports etc) to support the industry and make it work, and at the same time government should have an interest in building a strong private sector. The consumer can be protected by quality control and pricing in order to promote domestic demand conditions. This will causes changes in the dietary habits of Libyan society, thus enhancing Libya's food security. The Libyan government can deliberately create policies to encourage fisheries in the face of a booming oil sector. This will bring down domestic costs of production and distribution to further encourage diversification; in the long run this means that the surplus can be exported. This is not inconsistent with the promotion and development of the private sector, which should be a major goal of the government through its support for the development of the fisheries sector.

This chapter shows the different ways Porter's model can be used to understand the fisheries sector in a developing country like Libya. The model has shown that the Libyan fisheries sector is at the factor-driven stage and requires capital investment to move onto the investment-driven stage – to benefit from competitive advantage. The model has highlighted the factors that affect the whole fishery sector at both macroeconomic and microeconomic levels. It is evident from the analysis that reductions in state-ownership, official intervention and private sector participation in the fishing economy have predictable potential to build a competitive fishing industry that could be an engine of economic development. However, Porter's model lacks the ability to predict, especially in light of a chance definition of unexpected events. Libya is emerging from a conflict situation into a phase of political transformation, whose future is still unknown. Whether the outcome will be a stable political-economy that could pave the way for investment in fisheries remains to be seen.

Chapter three has shown that Libyan government intervention in terms of investment is not positive in fisheries. Using responses from field work and documentary evidences, this thesis suggest that basic factors such as labour shortages, domestic raw materials and a lack of research and training programmes create pressures to innovate around them. Some of the themes that emerged from the study categorise human resource, demand and supply, competitiveness and rivalry from other protein products, government attitude and regulatory weaknesses, poor backward and forward linkages, market expansion and technological innovation as factors that affect fisheries production in Libya. In addition, the demand for fish in Libya will increase if the state facilitated procedures and sought to reach the level of infrastructure standards required at regional or international level. The fisheries sector will then contribute to a gradual change in the process of economic diversification of the national economy and in achieving food security.

Chapter Twelve

Conclusions and Recommendations

12.0 Introduction

This chapter draws together the findings of this research - which explores the strengths, weaknesses and opportunities of the fisheries sector in the eastern region of Libya and its ability to achieve competitive advantage for economic diversification – and explore the implications of the research for theory and practice. Bringing together all the evidences collected from multiple sources has enabled the findings gathered in this research to be viewed with respect to Porter's Model and the wider literature on national competitive advantage. The analysis of data from the literature, questionnaire survey, interviews, documentation and visual material (photographs) contained in chapters two, three, four, six, seven, eight, nine and ten, have comprehensively elaborated the aims of the thesis. The chapter follows on to explore the contributions of Porter's model in diversifying the Libyan economy using fisheries as one vital sector, the contributions of this study to national competitive advantage and by extension management of economies, and considers potential areas for extensions and recommendations for policy and practice. The chapter is organised as follows. Section 12.1 emphasises on the major findings and contributions of the thesis. Section 12.2 highlights the contribution of PDM to Libya's fishing sector. The contributions the research makes to both theory and practice are contained in section 12.3. In section 12.4, the limitations of the study and areas for further research and policy options (12.5) were recommended.

12.1 Findings and Conclusions

This study set out to explore the strengths, weaknesses and opportunities of the fisheries sector in the eastern region of Libya and its ability to achieve competitive advantage. PDM was applied based on a case study of fisheries in the eastern part of Libya to achieve five research objectives, which were identified in the opening chapter of the thesis, as follows:

1. To critically review the existing literature on resource abundance and development and to establish how Libya has failed to develop other sectors to diversify the economy.

2. To explore and assess the current status of fish production and related supporting fish industries in east Libya.

3. To study and assess the current status of fish demand, and identify incentives and barriers to fish consumption that affect consumers in the eastern region of Libya.

4. To explore the features of the foreign trade of fishery.

5. To examine the extent of government's participation and whether they meet producers or consumers' needs and expectations.

Objective One: To critically review the existing literature on resource abundance and development and to establish how Libya has failed to develop other sectors to diversify the economy..

The purpose of this objective was on the one hand to gather literature about resource abundance and situate Libya, and on the other hand, how that has impacted other vital economic sectors. The sector that has been impacted by the resource curse is agriculture because the presence of oil has limited its potential to be fully developed to enable Libya attain food security. Moreover, fish resource, which is in abundance, receives the least attention, and consequently, curbs the sector's contribution to economic growth, food security, and self-sufficiency of protein for an overall healthy society. One of the first conclusions drawn from this research is the particular role that oil has played in the Libyan economy. The research has shown that Libya is a wealthy country and that wealth comes from oil production and export but unfortunately, it is unable to transform the relatively undeveloped fisheries sector to reduce the impact of a reduction in export earnings, address food shortage problems and promote human well-being. The literature review in chapters two and three, together with analysis from secondary sources, pulled together the relationship between 'resources' 'abundance' and 'development' and located it within the Libyan context. It elucidated the impact of over-dependence on revenues from oil resources in developing countries, with particular emphasis on Libya as a resource-cursed economy in some oil rich developing countries. The right macroeconomic environment supports the creation of a competitive advantage in any sector or industry at the microeconomic level.

The findings and discussion indicate that Libya, as a developing country, rich in oil, earns huge revenues from oil which should be reinvested in the development process and the creation of a number of other productive sectors. However, the Libyan economy, like many developing oil-rich economies, suffers from the so-called 'resource curse' and Dutch disease, which means that non-oil sectors, such as agriculture and manufacturing, make a diminishing contribution to the GDP. Although the Libyan government has always aimed at economic diversification and self-sufficiency - an intention clearly evident in the five economic development plans (see sections 3.1 to 3.3) - it has failed to develop agriculture, probably due to 'rentier' behaviour. Libya has become a net importer of food due to many factors, some of which affect the macroeconomic environment negatively, making it difficult to achieve the goals set out in the development plans. In addition to government's abysmal attention, extreme natural and climatic conditions hamper the growth of the agricultural sector. That is why to date; Libya suffers from the paradox of plenty – a lot of wealth from oil, and a lot of potentials from fisheries. Yet, oil has not led to the desired development of the citizenry and fisheries remain underdeveloped, thus limiting contribution of the value chain to the economy. This thesis therefore concludes that the current economic structure of Libya, which currently depends only on oil, can be diversified if agriculture in general, and in particular fisheries, is improved, and genuinely integrated into the main economy. However, before attaining any level of improvement, the fisheries sector must first be evaluated to appraise whether it could be transformed into a competitive sector (or industry) that is able to serve a national advantage.

Objective Two: To explore and assess the current status of factors of fish production and related supporting fish industries in east Libya.

This objective unfolds the starting point necessary to enter into a competition. Traditional economic theorists (see section 5.1) identify labour, land and capital as the factors of production. However, it was argued by Porter (section 5.2) that while inherited factors are important, the critical element of modern competitiveness is for countries to improve their existing factors and creates new ones. The major findings in this aspect of the PDM Model are that Libya's factor conditions, namely; physical resources, human resources, knowledge resources, infrastructure and capital resources in the light of fisheries, analysed in chapter eight, shows both strengths and weaknesses. The findings showed that inherited factors including (geography and resource abundance) give Libya a competitive advantage but they require ongoing development through continuous investment; these factors are important in the fisheries sector of

Libya if a sustainable competitive advantage is to be achieved. Libya's strategic geographical location should play a key role in lowering cost and helping competitive advantage in its fisheries sector (see section 8.1.1 A).

In terms of the fish stock, despite the FAO's announcement that the Libyan coast has a rich fishing potential. A report on Libya in 2005 by the National Foundation for Maritime Investment (2005:11-12) ascertained that there has been no recent studies estimating the size of existing fish stocks, and findings from this thesis can confirm that the last comprehensive study of Libyan fish stock took place (in 1996) 19 years ago. This finding shows that there is insufficient data in terms of fish stocks, species, level of fishing and the level of pollution along the Libyan coast. However, the estimation of fish stocks by the Libyan government in co-operation with regional or global water and marine institutions and multilateral organisations is now imminent (FAO, 2009); a mechanism is to be put in place to ensure a sustainable fishing path in 2010. This kind of strategy is in line with Porter, who emphasised the role of the mechanisms creation factor. He stressed that the success of an industry lies in its ability to create and develop the factors needed because countries are only competitive when they have specialised expertise and strong institutions. As shown in Figure 11.3, in Libya, the task of the management and operation of state research centres and institutions is undertaken by the Ministry of Agriculture in order to develop the database, which in turn makes available a database that offers opportunity to create a quality and specialised factor.

Human resource is one of the factor conditions considered by Porter as an important factor in creating a competitive advantage in the industry (see section 11.2.2, B of the Discussion Chapter). It was found that the vibrancy of oil production as well as the development and growth of the public and services sectors impacted negatively on agriculture, which had been the backbone of the Libyan economy. Because these sectors offer better remuneration than agriculture, there was mass exodus from the rural areas of young entrepreneurs and migrants who had previously engaged in agriculture for their livelihood. Thus agriculture, including fishing and animal husbandry, became less attractive and its contribution to the GDP or provision of employment opportunities shrank (see section 3.1). Human resources have been investigated in detail in terms of the number of fishermen, skill level and the extent of technology use in the fishing industry. Using PDM, the researcher has been able to identify weaknesses within human resources (such as, lack of technical skills, absence of business acumen, poor education, no entrepreneurship) as well as opportunities and appropriate solutions to upgrade it.

As previously pointed out in section 5.1.2, competitive advantage can emerge as a result of shortcomings since pressure leads to innovation. The researcher also relied heavily on the concept of selective factor disadvantage to address the factors that stimulate the development of human factors in fisheries, enabling it to become a specialised factor. This could be remedied through education, training and skills acquisition in colleges and institutes specialised in marine studies (see figure 11.4) or through NGOs. Financial allocation for the fisheries sector is low and not commensurate with its potential to contribute to economic and social development. For example, insufficient finance for fisheries is affecting the size and number of loans granted to fishermen and thus adversely affects the ability of the sector to attract workers to the occupation. The state's lack of transparency together with nepotism and tribalism are social ills in the system that limits the ability of genuine fishermen to gain access to no interest loans from the government. Also, existing legislation on the fishing industry is incommensurate with investment promotion and the development drive of the country. This is an obstacle to the creation of an environment enabling investment, and there are no guarantees to persuade investors that their rights will be protected. Lastly, due to the current condition of fisheries in Libya, there are no renowned foreign investors and participants in the international fish trade – this opportunity for earning revenues and taxes in the fisheries sector is missed.

Findings from empirical studies clearly show that fisheries sector suffers from infrastructure weakness. The current state of ports and fish markets infrastructure in the eastern region is one of the main reasons that Libya's fish is delayed in getting to local markets, where such markets need to meet certain quality standards in infrastructure. Ports are not of a modern design and lack many of the services and facilities needed by the fishermen and the fishing harbours (see table 8.3). With regard to fish markets, there is one specialised wholesale market for fish in Benghazi, in the eastern region, but the market lacks many basics, such as air conditioning and quality control requirements. The smaller markets spread across the region are made of small shops that lack the necessary equipment, such as new and modern fridges to store and conserve fish stock; and, furthermore, fish are often exposed to sun and dust. Again, funding shortfalls and inappropriate legislation have led to low investment in infrastructure; hence the need for strong direct support from government-funded investment as well as indirect support, for example, by modifying the laws to make them attractive to both government and private sector to invest in fish infrastructure – a digression from the current state of government responsibility alone.

The second part of the first objective was to assess the industries associated with and complementary to the fisheries sector. Recent research has confirmed that industrialisation is critical to the prosperity of nations (World Economic Forum, 2012); and Porter also confirms that the cluster has a role in achieving competitive advantage (see, section 5.2.3). This study found that there are other complementary and related industries in the area of fisheries - industries that provide equipment to the production process such as boats and fishing equipment. Also, there are industries related to downstream that deal with the product - fish, such as processing plants, canneries and feed mills. Results showed that private-sector-led factories run efficiently and at good technical level, while government-owned factories work less satisfactorily and are poorly managed. Corruption, mismanagement and a lack of a skilled national workforce, the high cost of the production process, inappropriate legislation and overlapping powers between government departments are the reasons for low performance. Generally, inadequate investment, poor funding, institutional instability and low national employment skills account for the poor state of supporting and complimentary industries. There is a shortage of ice plants, one of the most important inputs in the productive process affecting the quality of fish. All these mentioned problems, with forward and backward linkages, are most important in driving the industry towards competitive advantage and will have positive effects on development and the economy. Apart from setting the industry to competitiveness, developed fisheries in addition to the contribution they make to the national economy, will also raise the level of food security; results prove that there is great demand for canned fish products such as tuna and sardines. Even if the Libyan market is limited, regional and international markets can be explored.

Research Objective Three: To study and assess the current status of fish demand, and identify incentives and barriers to fish consumption that affect consumers in the eastern region of Libya.

Chapter nine has shown that domestic demand influences the competitiveness of products. This finding confirms Porter's (1998) postulation that demand plays a vital role in creating competitive advantages and growing demand from producers stimulates innovations and improvements for domestic firms to compete with foreign competitors. The size of domestic demand and the nature of the needs of the buyers are the two determinants of demand factors for achieving competitive advantage in the industry. In relation to the size of domestic demand for fish, results demonstrated that the level of consumption of fresh fish in the eastern region is very low. Those who eat fish more than three or four times a month did not exceed 8.5% of study participants. This was due to the factor conditions mentioned in objective one above. In order to understand the factors accounting for the very low demand for fish and the factors affecting them, Shepherd's model was applied to accurately investigate factors influencing eating fish. Drivers of the very low fish demand in the eastern part of Libya were revealed to be demographics, participants/consumer specifications, quality of fish and market access. The impediment to demand for fish in terms of demographics are family size, family head's social and economic status, family head's meal preferences, ethnicity and place of origin, customs and traditions, poor retailer upgrades, low literacy level and poor awareness of the health implication of fish consumption in comparison to beef or lamb, and the importance of fish to individual health and national food security. There are also issues surrounding inconvenience in buying fish, choice, year round availability, scepticism about preservation and hygiene condition of fresh fish in the fish shops. All these are the major reasons for low fish consumption in Libya. Among all these reasons, high prices of fish in the market and family income are the most important factors limiting fish demand. These findings support Shepherd (1985), Porter (1998), Timmer (2010) and FAO (2014) assertions that high food prices not only undermine consumption it signal shortages in the supply of current and expected future food availability.

To test the validity of the above assertions, a Chi-square test and the logistic regression examined the variables that affect fish consumption in the eastern region; and the statistical analysis showed that the most influential factors on fish consumption are family income and family size, ease/difficulty (convenience) of preparing the meal and the age of the head of the family. It is also noteworthy that the convenience of preparation of fish meals came second to family income, in terms of impact on the size of fish consumption. It can be argued that this result is useful in stimulating the development of fish processing factories and preparing ready-made/partly-ready fish meals. This is because even those consumers who claim not to eat fresh fish do consume canned tuna. The reasons are: 1) it is an easy cook meal already prepared; 2) it has no odour; 3) it is better in terms of hygiene; 4) it takes less time to prepare even for large family; 5) it is a bit cheaper than fresh ones and 6) canned fish can be found in road side shops and retail stores. Hence the thesis concludes that these are good signs of upward demand, which can also be used as an incentive for the development of fish product industries. Although the current situation shows that conditions of domestic demand are still far from being a source of competitive advantage, the results have proved that opportunities that can be a starting point for building competitiveness exist. This thesis therefore concludes that: it is possible to seek lower prices, improve standard and make fish available in many places of the city, particularly near residential areas. The research also suggests that further promotion and investment into the fish processing industry would be essential to transforming the fisheries sector due to the popularity of canned fish products and tuna especially Libyan consumers.

Research Objective Four: To explore the features of the foreign trade of fishery.

Porter maintains that export or foreign markets can be a way out for countries with a limited domestic market. Marketing and the international market can be seen as an alternative to domestic demand. Findings showed that fish exports are very low and have been barred since 2009 in Libya, despite the fact that some fishermen attempt to deliver their catch to neighbouring countries. Even before the export ban, one startling revelation that emerged from this research is that since Libyan fish cannot enter the international market directly, fish catch from Libyan waters are smuggled into Tunisia (in the name of trade) and then prepared to meet export market standards. The fish stock is then exported to Europe by middlemen or re-imported into Libya as processed fish. This occurs because Libya has no fish trade agreement with the European Union. Moreover, the moribund state of the country's infrastructure and fishing methods hamper large-scale high-tech fishing. Fishermen and fish traders have passionately lobbied government to establish a fish export market and regulate it so that it can serve as an important factor in the improvement and development of fisheries. This would allow technical skill acquisition and knowledge transfer of modern fishing equipment and regulations. While the options for exporting Libyan fish products can increase the economic, social and environmental benefits for the country, there is still work to be done on clarity of the impacts regulations such as in monitoring, control, surveillance, harvesting quota, processing standard and shipping platforms. Whether Libyan institutions are able to carry out these functions cannot be determined until specialised factors are reformed. Tunisia has a moderate seafood export market that can be scrutinised to draw lessons from.

Research Objective Five: To examine the extent of government's participation and whether they meet producers or consumers' needs and expectations

The discussion in 11.2.1 as well as chapters two and three indicates that oil-rich Libyan government has direct control over the development of all sectors, including fisheries. There was no role for the private sector within the management of this sector. However, institutional weakness and instability make it difficult for public institutions to continue the implementation of the marine and fisheries development plan and budget allocation to fisheries projects. Low investment in human capital, which is the first step to achieve competitive advantage, adversely affected the capacity of the institutions and fisheries sector to produce fish for local consumption and for external trade. The poor quality and lack of enforcement or implementation of policies, legislation and regulation of fishing hampers large-scale investment. As noted in the introductory chapter and chapter four of this thesis, fisheries has potential to represents a significant component of the Libyan economy and utilising the full potential of the sector can make an important contribution to employment and wealth creation in local areas. In light of this, updating the relevant laws and policies is undoubtedly of practical value to promoting this sector.

Libya is marked by financial and administrative corruption in the public sector, theft and looting of state resources, nepotism and tribalism; and a lack of effective administrative control of the state apparatus; this confirms what is happening at the macroeconomic level (see chapter two). The state has also failed to create cooperatives for fishermen to support fishermen in many ways. Government has also failed to create a bridge between users and regulators; there is a total exclusion of fishermen from fishery management – an issue that had led to nonstandard practice, which negatively impacts on the economic and environmental aspects of marine fisheries.

On the demand side, red meat and poultry are identified as the strongest competitors to the fish market. Findings made possible by the innovative use of Shepherd model shows that Libyans have a preference for red meat and poultry for their sources of animal protein over fish due to tradition, high prices, unavailability of fish/retail markets and tricky/time consuming preparation methods. The supply chain gap between the fish vendors themselves has not been noticed due to the weakness and the apparent absence of the private sector. Local competition is what the sector first requires to grow. Porter has suggested that local competitiveness has to be built to boost local consumption which in turn increases production and boosts all other aspects of the industry, from infrastructure to production, distribution and retail to the final consumer. On the supply side, the production capacity of local meat represents 20% of the total capacity of production for the period of study (1991-2011) (see table 3.16). The average annual production of poultry is estimated to be 99,482 tonnes (negligible difference but satisfies local demand), however, Libya will need to produce more poultry for the next 10 years to close the 2,000 tonnes gap and accommodate diet changing behaviour. As for fish, Table 3.17 and 3.18 have shown that fish production is not meeting demand as there is 18.85 tonnes of fish food gap in 2011. Since local production is not bridging demand, foreign market was relied upon to reduce the difference in demand and supply.

From the above findings, there is food gap in animal protein. The size of the food gap depends on both production and consumption – an increase in production leads to a gap contraction and rising consumption without commensurate supply leads to gap widening. Because the factors affecting growth in consumption may impact factors affecting production, it would consequently increase the size of the food gap with the passage of time. Poultry, whose production is highest is, however, hampered by importation of materials such as animal feed, which also account for sharp fluctuation of prices. Price uncertainty results in supply interruption coupled with difficult environmental conditions (e.g. a lack of water and the scarcity of pastures) that severely limit livestock production in Libya. Conversely, there is all-year-round catch and the naturally long coastline provided a niche for fisheries husbandry, thus availing even a greater opportunity to meet the demand for animal protein. Local competition is what fisheries first require to grow. Porter has suggested that local competitiveness has to be built to boost local consumption which in turn increases production and boosts all other aspects of the industry, from infrastructure to production, distribution and retail to the final consumer.

In summary, the ideology of competitive advantage is crucial to the advancement of productive sectors in developing countries dominated by one sector, such as oil. If PDM is to be applied to Libya, the role Porter accords the government needs to be modified. In the case of Libya, the government's role needs to be central and direct because the fisheries sector is weak and needs strong direct support from the government in a positive way. The Libyan case shows that there is adequate cash flow from oil revenues large enough to be used to develop the rest of the economy and to build standard infrastructure and create a fish supply value-chain. While Porter felt that the role of government is secondary and indirect, this is not the case; and it would be unsuitable for oil-rich developing countries: thus his model requires further modification to suite Libyan political arrangement. However, the use of Porter's competitive advantage theory has afforded this study, as indeed Turkey, Iran, Saudi Arabia, Egypt and Tunisia, the ability to unravel the inadequacies of the Libyan fisheries sector as well as its hidden potentials. It is vital that this sector be promoted to meet producer needs and consumer expectations if Libya's future economic transformation and sustained economic progress is to be secured - this is not impossible to achieve despite all the problems highlighted throughout the thesis.

12.2 The Contribution of Porter's Model

This section outlines the contribution Porter's Diamond Model (PDM) made to determine the current competitive advantage of Libya's fisheries sector. In contrast to countries like Jordan, Iran, Saudi Arabia and Egypt that have a fairly well developed agricultural system and are self-sufficient in food, Libya's limited agricultural resources was left to stagnate from the very first time Libya started exploiting oil in the 1950s. Historical account of Libyan economic transformation presented in chapter three indicated that Libya depended on aid and agriculture prior to oil discovery and had initially made efforts in the 1970s to develop agriculture as the country suffers from food insecurity. However, those efforts were focused more on irrigation and cereal crops production and again depended on import market for meat and poultry products. Fisheries during the 1970s up to 2011 received little attention in comparable to the overwhelming potential of the sector. It is also important to note that Libya has the largest coastline in the Mediterranean which has abundant fish resources. This happened throughout the reign of former Libyan dictator, Moammar Ghaddafi, who ruled for more than 40 years until 2011 when he was ousted during the Libyan unrest. The catalogue of reasons for this neglect can be found in section 1.7 and throughout chapter three, among them are; effects of oil wealth and export, Dutch-disease effect, lack of interest from past leaders, seen as a traditional occupation, institutional instability, and underestimated sector's potential.

Consequently, unlike the way oil is being exploited, the fisheries sector has remained a dormant activity in Libya. The research has shown that Libya has a coastline length of 1970 kilometres but there is limited information on the population, community, habitat, and sub-region levels, taxonomy distribution, abundance, and temporal trends of several fish species. The total production of various fish species from this underestimated coastal water ranges from 35,000-39,000 tonnes per year with an estimated value of LYD 97 million (US$ 80m) was produced in 2004 according to FAO (2008) estimates. This production consisted of around 16100 mt of small pelagic (horse mackerel, mackerel, sardine and bogue), 2000 mt of tuna and about 18400 mt of demersals (mainly red mullet, breams, groupers, amberjack, common denntex, triggerfish, common panndora, octopus, cuttlefish, squid and shark) and other fishes are around 3000 mt. The fleets used in catching are mainly artisanal (using small boats, nets and hooks), lampara (motorised vessel for fishing small pelagic between Misrata and Tunisian border), coastal trawling (use steel and wood stern trawlers), and tuna fishing (operate at industrial scale using longliners and purse seiner and nets extending up to 3 km). Sponge fishing covers minor part of the fishing fleet. At full capacity the economic value these activities can generate billions of dollars a year.

The findings of this research are generally supportive of Porter, meaning that the diamond not only works well in a developing country setting, it has worked well in countries that are rich in resources (such as oil) that has inhibited their ability to develop other sectors. With this thesis, the PDM has provided a picture of fisheries that would otherwise not have been possible with relying on just traditional research methods (e.g. questionnaire or interviews only). The six PDM determinants have touched on every aspect of the industry. Section 5.2.2 has presented case studies of the application of Porter's model and this thesis findings indicate that the model can be expanded to cover sectors different from those in earlier studies (Heeks, 2006; Nater and Cini, 2009; Kuldilok, 2009; Al-Hiary et al., 2010; Barbe and Triay, 2011; Taing-peng and Xiaing-bing, 2011; Esen and Uyar, 2012; Bakan and Dogan, 2012; Deniz et al., 2013; Bashiri et al., 2013; Abdel Gawad et al., 2014). These authors have used the model in sectors ranging from agriculture, trade, manufacturing and services from developing countries other than Libya. While the authors focus are more on competitive advantage for the export market, this thesis is largely about using the sector for economic diversification, in addressing food security issues and in boosting local demand before considering export market. In other words, this thesis has extended Porter's application in a country with oil wealth, has little or no diversification, faces food security issues and has not exploited huge potential from fisheries. The application of PDM to the Libyan fisheries sector made it possible for the researcher to evaluate and evidence the current state of fisheries sector and what can be done to make it productive.

Porter regarded government as an assistant in creating competitive advantage, but denies a direct role other than through the determinants. The research found that when Porter's diamond model is applied to oil rich developing nations, such as Libya, the role of government contradicts Porter's hypothesis because there is the greatest direct government interferences. The research therefore suggest that instead of government role being indirect as argued by Porter, the role of government should be positive, direct and central. A view which was also espoused by Stopford and Strange (1991) who advocated that government should be treated as the fifth factor instead of being recognised as a merely exogenous factor within the diamond model particularly in the factor-driven stage of national competitive development. The direct intervention of government in the other four factors (factor, demand, related industry and structure) can be re-designed and re-structured within the model. For example in terms of demand conditions, government can legally enforce high quality standards for fish. However, the government role will shift over time as the economy generally becomes more sophisticated or as the dynamism of the sector changes from factor to wealth driven stage. Government may not be able to directly influence chances conditions of Porter model - but could maximise the advantages that come with it, and minimise the damages - because they are unforeseen situations. For example, the Libyan conflict was an unexpected development that has provided an opportunity to revive and transform fisheries in building a new economy in a post-conflict reconstruction strategy. The modified Porter model (shown in figure 11.6) suggests that whilst the government effectively performs its core functions in the economy, it withdraws from, or drastically reduce its role in fisheries ownership thereby eliminating its direct influence in the sector. This thesis would argue that indirect influence of government can be maintained through tools such as fiscal control and legislative interventions to drive up demand for Libyan fish.

There are other areas Porter's model has been useful in understanding Libyan fisheries. First, the diamond model shows that the fisheries sector is still at the factor-driven stage. This is the first stage of the four dynamics of national competitive strategy proposed by

Porter (1998). It is the stage where an economy and its sectors are primarily dependent on comparative advantage (i.e. an abundant supply of basic factors). To move to the next stage (investment-driven), heavy investment is required in facilities and foreign technologies. Indeed almost all sectors in developing countries are at the factor driven stage, and Libya is no exception. Subsequently, the innovation driven stage is when the diamond is strongly developed where firms not only buy and apply technologies, they create them. The final (wealth driven stage) of this transition is a situation of preserving the acquired wealth and using it to shift preferences. However, the Libyan situation remains stagnant due to the factors identified in section 11.1, which include dearth of highly skilled and educated fishermen, poor investment in infrastructure and capital, poor fish-eating habit, lack of technology and lack of fishing industrial clusters, institutional instability and widespread corruption, poor management of small-scale fisheries, unsuitable policies and legislation and lack of government investment. Secondly, competitive advantage theory as used in this research highlighted the factors that affect the whole fishing sector at both macro and micro economic levels, which include lack of organisation and domination by artisanal fishing and poor integration with larger economy. Thirdly, competitive advantage theory has identified strengths, weaknesses, opportunities and threats inherent in the fishery sector as outlined in sections 11.2.1-11.2.5, for example, the favourable location of Libya along the Mediterranean Sea coastline, fish stock availability and proximity to European market is considered an opportunity. Most importantly, the core of PDM is the relationship among the determinants, and how the determinants of the diamond model affect and reinforce each other has been reconfirmed by this study.

Overall, Porter's diamond model has taken into account most or all of the elements affecting Libyan fisheries, in a national and international perspective, and defined ways to develop private sector fishing for national growth and food security. As suggested by Grant (1991), this study has once again reaffirmed that the, determinants of competitive advantage alluded to in Porter's theory of competitive advantage are not clearly defined. As this study reveals, in a number of cases, the variables relevant to the different facets of the diamond model overlap. For example, skills were discussed under factor conditions and in supporting related industries; also, law and legislation appeared in government intervention, demand conditions and related industries. Notwithstanding that the six factors that form the diamond system differs from location to location and therefore may change overtime.

In addition, the hypothesis of selective factor disadvantage supports Porter's view (1998:81-82):

> Competitive advantage can grow out of selective factor disadvantages; disadvantages in the basic factors such as labour shortages, domestic raw materials, or a harsh climate create pressures to innovate around it.

The hypothesis of selective factor disadvantage is one of the catalysts for development and upgrade; some parts of this discussion depend on this hypothesis to predict what the outcome of investment and the development of determinants will be. In addition, this thesis suggested that comparative advantage, including long coastline, fish stock wealth, proximity to Europe and other fish importing countries, growing local fish demand, increasing standard of living and healthy eating, could be the basis for creating competition. For example, Porter states that: "virtually all internationally successful industries in the nation draw their advantage almost solely from the basic factors of production" (Porter, 1998:546-547). This means, Libya stands to gain from its basic factors to create specialised factors for fisheries advancement.

What Porter had not taken into account was that sectors such as fisheries have unusually close connection to the environment, where sustainability and conservation is vital to future supply security. This feature distinguishes catch fisheries from most other sectors. For example, as the demand for fish increases, supply naturally goes up to cope with the demand but producing fish directly depends on the ability of the marine environment or coastline to sustain fish production in the future. In this regard, this thesis has contributed to the application of Porter's model by analysing the influence of the PDM determinants in developing or building a competitive fishing industry in Libya as well as on how to improve the model to capture features of Libyan state and fisheries uniqueness to other natural resources. In general, PDM has provided a very good case for application to other Libyan sectors and other countries with similar economy to Libya. However, it is suggested that to capture the concept of fisheries sustainability, Porter's model should be redefined or modified to integrate fisheries sustainability, not only for meeting the short-term needs of consumers but for the future as well.

12.3 Contribution to Knowledge

As indicated in chapter five, models currently used to study sectorial or - industrial development in developing countries are either not applicable or miss external factors, such as demand, chances (such as wars, oil shocks, new inventions, exchange rate changes, changes in demand, political instability), and structure and rivalry that are critical in the survival of industries. This need to search for answers outside the chosen model, necessitate the need for a more comprehensive framework that covers all aspects of fisheries. As argued in Chapter five, Porter's model appears a suitable choice because its principles are based on research across a variety of industries and countries.

Through the application of Michael Porter's theory of competitive advantage to Libya, this study makes several contributions to knowledge. Firstly, the this study contends that oil rich developing countries like Libya could adopt a competitive advantage strategy to overcome the problems of the resources curse and Dutch disease, by developing productive sectors, and changing their economic structure to move away from a rent-seeking economy. Secondly, by applying Porter's Diamond Model to Libya, the research demonstrates how factor conditions, sophisticated home demand, related supporting industries, intense rivalry, structure and strategy, associated chance and government actions all contribute to creating advanced and specialised industries that can contribute to both increased productivity and the further diversification of the Libyan economy. Application of Porter's Diamond model has also proven useful in analysing the development of the competitive fisheries sector in Libya. However, the largest contribution to knowledge made by this research lies in the alteration of the role of government in the diamond model, from playing an assistant role to a central role in the competitiveness of fisheries. As mentioned in chapter four and indeed throughout the thesis, the fishing industry has not been well established and developed in Libya for several reasons, and while PDM is applicable to Libyan fisheries, the sector needs government's help to grow in future. Government need to stimulate the other four factors in the industry, and take actions in regulations, creating favourable investments, marketing channels, infrastructure and so on. Libyan fisheries need a government protectionist approach to advance it in a similar manner that advanced countries benefitted from at the initial stages of their development. This protection can come through tariffs and taxes, subsidies and other measures (Chang, 2003). Clearly, this would only be possible with a genuinely far-sighted government helping to overcome these barriers. The question is: as Libya goes through a post-conflict reconstruction phase, will it result in such a type of government? Once such a new government is in place, decisions relating to the development of other competitive sectors such as fisheries are likely to be made. Such decisions will signal new Libya's willingness to be fundamentally different from the 'rentier state' established by the past regime (i.e. using oil revenues to particularly develop those sectors with high potential to contribute to diversification).

Thirdly, this thesis makes a significant contribution to existing knowledge in the wider literature on nations' competitive advantages in general and the Libyan economy in particular. As far as the researcher can ascertain based on the available literature on fisheries in Libya, this thesis is the first to assess the competitiveness of fisheries development in Libya. There has been no other attempt to employ the critical realism approach adopted by this study in relation to PDM. Furthermore, this research has investigated the impact of macroeconomic features in Libya on economic development and on the performance of the fisheries sector. The same approach was also adopted to investigate how and what mechanisms to use to develop the fisheries sector to achieve competitive advantage. The critical realism approach focuses on the critical causal mechanisms that explain the reasons behind the success or failure of this sector. In order to investigate demand conditions more thoroughly, the study integrated a Shepherd's consumption model with the diamond model, which contributed to understanding the factors affecting fish consumption and when addressed can boost the current low domestic demand. While these strategies have answered the questions this research seeks to investigate, new and updated information in the Libyan fisheries sector have emerged. Evidences that emerged from this research can serve as an important guide for the post-war transformation agenda. This is imperative in the contemporary rapidly changing global economy where nations achieve competitiveness by optimising their strengths and remedying their weaknesses in the light of opportunities and threats presented to them.

Finally, this thesis contributes to existing knowledge relating to the factors that affect food choice in general and fish consumption behaviour in particular in Libya. The findings have revealed that the advancement of the fishing industry will contribute to the promotion of food security in Libya, especially as fish protein has great health benefits. The provision of fish of the right quality and at the right price will contribute to make fish accessible for the Libyan consumer, thus changes the dietary habits of Libyans and enhances food security. Libya has a growing population and this implies that agricultural products face potential increase in demand, and any increase in demand for fish simultaneously affects the growth of the industry in accordance with Porter's

(1998) theory of comparative advantage. The various aspects of fish, from catching to handling, processing, distribution and marketing or trade both at the domestic level and between states has a significant role in economic development, either directly or indirectly, through the provision of employment and income. For example, if the current agriculture are developed and organised, and fisheries role of the private sector increases in artisanal fishery and small and medium-sized fishing enterprises, it would be seen as a vehicle to attract domestic and foreign private investments, hence raise the private sector's contribution to GDP, provide new work opportunities for the unemployed workforce and facilitate technology transfer, innovation and sophistication of the industry.

12.4 Critique of Research Approach and Further Research

In reflecting upon the main aim and objectives of this study and the conceptual – methodological - approach designed to satisfy them, it is possible to identify some limitations. It would be recalled from section 7.1 that this study adopted a critical realism position, which implies that the knowledge of reality (the fisheries sector as a real structure in Libya) is a result of social conditioning and cannot be understood independently of its social actors (fishermen, wholesalers, government officials and representatives in the fisheries sector). The complex nature of the different parties and stakeholders involved in the Libyan fisheries supply chain, and the high level of variation found with respect to geographical location, creates difficulty to completely uncover empirically the many interrelated factors and facts around the fisheries sector; which makes it obviously complicated when drawing generalisations. This limitation agrees with Jessops (2008: 229) that: "all knowledge is partial, provisional and incompletable". This means that other areas can still be explored. Therefore, consideration has to be given to the most appropriate way of collecting data about fisheries in Libya. The combination of methods applied has made it possible to comprehensively present a general picture of the situation of fisheries in Libya, including the dearth in the sector, and how the sector can achieve competitiveness; and in doing so diversify the mono-product Libyan economy and attain food security. The areas that have been addressed and discovered by this study have wider implications for future study of the inter-relationship between resource abundance, economic diversification and national competitive advantage in developing countries.

The limitations outlined above identify a number of areas that can be addressed in future research, or conversely, alternative research questions that this thesis could have addressed as part of its objectives. Firstly, the findings obtained on the weak production quantities of fish in Libya were based on documents obtained from government agencies and regional organisations only. It was noted in chapter seven that these documents reflect the attitude and aim of the people and organisations that collected the data. As part of this research's effort to reduce or eliminate these biases, similar documents from a number of international organisations were collected to corroborate information sourced locally. In view of this, it is recommended that future study should validate the findings and conclusions of this thesis by conducting empirical research about production quantities of fish in Libya. To compliment findings from quantitative approach, it is possible to include qualitative approach for robust outcome. Through the application of qualitative research it will be possible to explore and understand the conditions under which fishermen catch and produce fish. In contrast to using just questionnaire to arrive at quantities, it may be more effective to use focus groups in the conduct of this future research. According to Morgan (1997), focus groups provide the opportunity for discussion between members of interest groups. In this case, bringing the fishermen together from all the regions in Libya to discuss among themselves on the overall problems inherent in the sector, and to understand the conditions required for the successful re-development of the sector, based on the findings made possible by PDM. This type of method has been used successfully with fishermen (see, for example, Creative Research, 2009). Importantly, any shift towards fisheries should encompass the development of structures that enables attaining competitiveness identified through chapters 8-11 and the realistic integration of fishing into future economic development strategies of Libya.

Secondly, the findings confirm that supporting and complementary industries of the fisheries policy, which are one of PDM's determinants, face many problems, and generally private factories appear more efficient in terms of production than public factories. This conclusion was arrived at based on an examination of official documents and interviews with fishermen and vendors only. Time and budget constraint did not permit the study to interview managers and workers at these factories to determine the circumstances surrounding fish factories and the factors affecting them. Further study could validate this speculation, and also investigate factor creation mechanisms that could create cluster in the fishing industry, which is significant in achieving competitive advantage. Thirdly, the research has identified three main problems facing consumer's choice of fish for food: 1) high price, 2) unavailability of fish shops which make fish consumption uncommon, and 3) cultural or traditional beliefs that limit fish consumption. Addressing these three consumer behaviour is inherently complex; and understanding the third problem may be understandably contentious. However, future research could be used to explore in finer details how prices can improve and make fish accessible to the consumers and most importantly how some fish consumption barriers identified could be removed to increase local consumption. For example, while the development of factor conditions may provide the means towards a revamped fishery and reduces prices and availability problems, the findings of this research indicate that low demand of fish from any production increase due to factor conditions can be inherently problematic. This means increase in demand conditions through rapid innovation and sensitisation have an important role for creating competitive advantage. Finally, further research can examine the applications of Porter's model in the light of how sustainability factors, namely, ecological, socio-economic, community-related and institutional factors determines or affects achieving fisheries sector competitiveness in Libya or any other developing country.

12.5 Recommendations and Policy Options for the Advancement of Libyan Fisheries

Government in Libya bears a large burden of responsibility for the success or failure of the sectors and large industries in the country and the responsibility is even higher when the state is rich in resources. Because of the availability of huge sources of revenue from oil, participants in the field survey have argued that such revenues should be used to strengthen the deficient infrastructure and all factor conditions for fish production. This was based on a question that asked about participant's opinion on how to increase the amount of fish production, which is considered weak compared to neighbouring countries and the countries of the Mediterranean basin. At this time of economic reconstruction, it is highly desirable that major efforts are made to direct state revenues from oil into much needed investment in basic infrastructure, human capital or expertise and to open up those economic sectors of competitive advantage. Libya must learn to approach the management of its oil wealth the way the Norwegians have. Norway's experience is regarded as an excellent example of how to derive positive outcomes from oil production. The following key points were collated from numerous participants' suggestions and from the PDM's findings on how to move Libyan fisheries forward.

These recommendations, which are by no means exclusive, are well-founded in view of the conclusion that government is to play a central role in the competitiveness of fisheries.

First, it has been stated that economic diversification encourages growth of non-oil based industries but this alone may not lead to diversification in Libya. What the country need is double diversification: economic and political. The latter promotes growth by redistributing the once narrowly based political power to the majority of people. This simply means that ruling elites that characterised past regime of Ghaddafi must now devolve their powers to the people by democracy and pluralism. Libya has to turn away from too much dependence on oil because as documented in chapters two and three, it has stifled, crippled and delayed the development of other sectors including fisheries sophistication. To function well and to be able to reduce over-dependence on oil, the following recommendation by Gylfason (2011:13) is crucial, particular as Libya is now on a road to national recovery:

> National economies also need broad political participation and a broad base of power in order to be able to offer the citizenry an efficient and fair way of exercising its political will and civil rights through free assembly, free elections, and such. Without political democracy, bad governments tend to last too long and do too much damage. The need for diversification is especially urgent in resource-rich countries because they often face a double jeopardy – that is, natural resource wealth that is concentrated in the hands of relatively small groups that seek to preserve their own privileges by standing in the way of both economic and political diversification that would disperse their power and wealth.

The above quote emphasises the need for restructuring of Libyan government that was built on oil based economy. When these changes are made, good governance ensures that institutions are radically reformed to be responsive and assures checks and balances in the system.

Second, it has been already pointed out in the findings and in various chapters of this thesis, no precise quantitative information at national level exist, neither on fish stock and captures nor on the socio-economic dimension, although some preliminary studies were carried out by the FAO to sample specific fisheries and target species. The need to improve knowledge about Libyan fisheries and to create private institutes and training centres to teach marine studies with specialties in fishing, has been underlined on many occasions. In order to provide a full picture of fisheries in Libya, some information are still missing and/or requiring further expansion. This thesis recommends for a policy that advances knowledge on Libyan fisheries through investment in research and development for firms, institutes and universities. This is by taking a comprehensive and an extensive inventory on the biological and bio-geographical parametres, as well as the characteristics of the fleets, gear and resources in space and time. This include ownership, size of fishing craft, vessel and engine, fishing gear and techniques, fishing grounds and the knowledge and technology of operatives in the sector. Similarly, this thesis calls for obtaining spatial information, such as spatial analysis of national fleets and resources distribution, to give an insight into what occurs and give an insight into the past, present and the likely future. Whilst this thesis has provided a comprehensive analysis of the sector and its competitive future, further information on the socio-economic aspect, in other words, specialised factor conditions, is fundamental for future planning and management. Main social and economic indicators should include: production, commercialisation, income, employment, wages, prices and profits and productivity per investment. Understanding these indicators seems indispensable in linking macro-economics, fisheries and development policies and livelihoods.

Third policy recommendation calls for a platform that organises national conferences strongly oriented toward national fisheries sector growth. Unlike a conference for academic exercise, the reason of such conferences is to allow representatives from the entire fisheries sector (fishermen, processors, traders, gear manufacturers, exporters, boat builders, cooperatives, unions, banks, research institutes, government and multilateral agencies) to brainstorm and formulate new policy recommendations through presentations and discussions. Such a conference brings together all stakeholders and their views into the open and by so doing allows participatory approach in finding solutions to problems and proposing way forward. In the Libyan context, this thesis is of the view that this is the only process of policy formulation that is put on a more democratic footing because all concerns can be taken into account, unlike the previous autocratic policies that applies the top-bottom approach and excludes sector operators in the process of policy formulation. Apart from these steps ability to strengthen the fisheries sector as a whole, it can lead to private sector contest for reform of national fisheries institutions as they have been identified weak to support and regulate services the sector requires. Similarly, it has been mentioned that institutional instability and the lack of stability in fisheries policy could signify inter alia a recurrent difficulty in formulating sound policy. This calls into question the greater problem of how best to formulate fisheries development policies in the first place. While the findings indicate that some policies made to support the industry were based on personal interest rather than in the interest of the industry, the power of fishermen cooperatives has not been utilised; whereas exercising political lobbying power by fishers' cooperatives has strongly influence and direct government policies and initiatives in some countries. It is well known that in a well-organised society, the formulation of policy and planning programmes is a complex mixture of political and social interactions. In this case, this thesis strongly recommends that the very few fisheries organisations identify themselves and form one united strong union, and organise themselves into articulate units, then use voice mechanism to make their demands known to the government. It would be difficult for a government to ignore the policy recommendations of a national conference as well as the pressures and agitations from fishermen organisations.

Fourth policy recommendation has to do with the establishment of factories for fishing boats as well as workshops for maintenance work that would accommodate all sizes of fishing boats and ships and enhances all aspects of fish production and distribution. For example, providing transportation, cold storage or building refrigerated warehouses to keep fish. The provision of loan and/or capital to fishermen without mediation is vital in promoting advancement. Some participants stressed that this must be non-interest Islamic loans, and loans for boats and equipment should be given at low prices, at reasonable and affordable re-payment rate, and a convenient payment plan.

Fifth, fishing regulatory framework that is considered an obstacle for the development of a competitive industry needs substantial transformation in order to attract foreign direct investment and maintain the few private sector fishermen. The relevant laws, policies and regulations that protect the industry and provides a platform for private investment and industrial growth requires continuous review and adjustment as necessary to ensure that outputs are in line with current fisheries development needs.

Sixth, as a result of the cost involved in fish distribution, the high cost incurred by crushed ice, refrigerated cars and grafts are passed onto consumers. In this instance, government must intervene in setting prices and could even subsidise the industry as economically feasible.

Finally, government should promote sustainable fisheries by preventing overfishing to protect certain species of fish from extinction due to the use of explosives, and it should stop the use of explosive materials in the Mediterranean. Also ban fishing by Jarafat boat in July and August because this is the time of fish mating. Prevent mesh small catch by small net eyes, interval fishing (without a break) or war on fish. The government should fight illegal methods of fishing such as the use of explosives and toxic chemicals. Marine resources should be protected from pollution and the piracy perpetrated by fleets from neighbouring countries and the Mediterranean. Sensitising fishermen and consumers for the purpose of preservation of the marine environment and optimal investment methods can be tied to marine protection.

12.6 Final Remarks

Libya, the largest holder of proven crude oil reserves in Africa and an important supplier of light and sweet crude oil to the global market, has witnessed tremendous inflow of foreign capital and revenues that powers government development drive. In spite of this, it is also a country grappling with the symptoms of the 'resource curse' and suffers from 'Dutch disease' and 'paradox of plenty' effects. Given the increasing manifestations of the above repercussions of over dependence on oil wealth coupled with the recent worsening of the economy, food security threats and political turmoil, diversification issues need further attention in Libya. The question is what difference does this thesis make? My response points to the theory, concept, data and the method adopted for the research. However, my modest claim is that it has succeeded in giving 'voice' to Libyan fisheries as an important sector full of potential for economic diversification and food security. It demonstrated the negative relationship between the availability of oil resource in Libya and the development of the fisheries sector. It shows that the oil resource availability has contributed to poor governance in Libya which has manifested in the form of dictatorship, weak government institutions, and low human capital development. The combination of these negatives hindered the development of other sectors critical to the sustainable development and economic prosperity of the country. Similarly, this thesis equally demonstrates the usefulness of the analysis of theories of national competitive advantage as proposed by Porter (1998) in revealing national productivity through sector/industrial development. The theory of Porter using the diamond model gives a new foundation for the industrial and commercial policy of government. Finally, it also gave the researcher the opportunity to understand and present to the reader a fairly good perspective of the state of fisheries in Libya. By doing so, this research has resulted in new information being provided relating to Libyan fisheries whilst also making a clear contribution to the large body of existing literature on the economics of fisheries. Finally, this thesis attests that a clear commitment to the growth of the fisheries sector needs to stem from the Libyan government through clear policies, in order for its people to reap the benefits of a vast fisheries sector rather than collapse under the threat price volatility within the oil market and the irresponsible utilisation of the countries natural resources and the emergent lack of productivity within the wider economy which in turn stifles economic growth and self-sufficiency.

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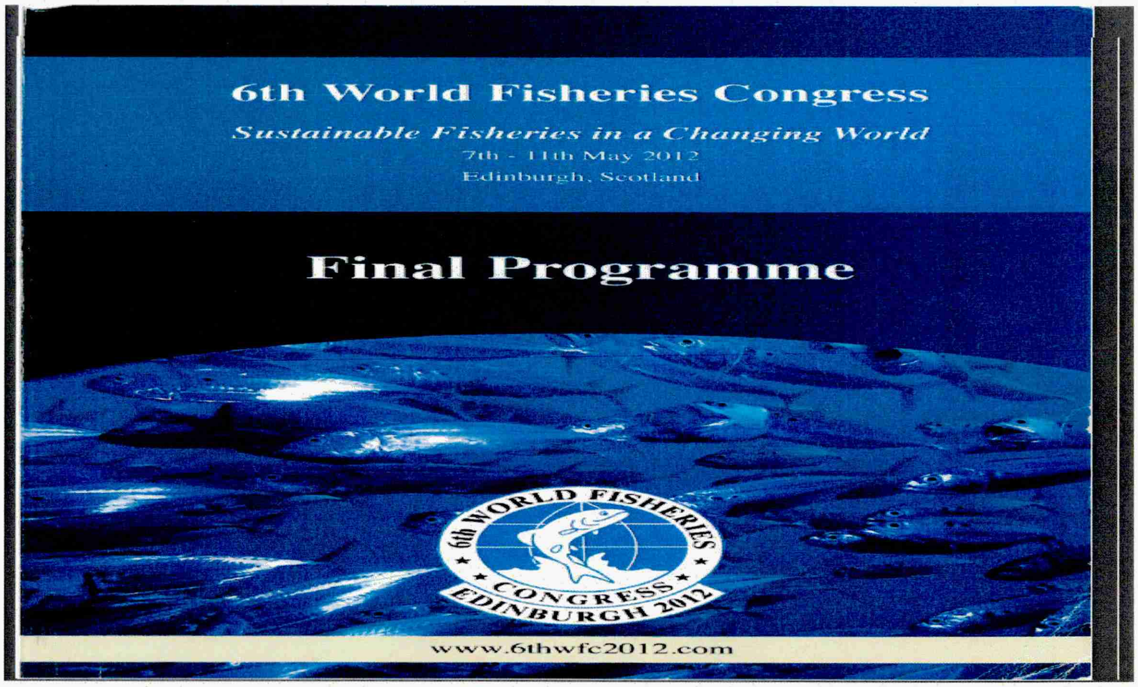
Appendix A

Electronic poster presentation at the 6th World Fisheries Congress which took place in Edinburgh from the 7th-11th May 2012



6th World Fisheries Congress

Sustainable Fisheries in a Changing World

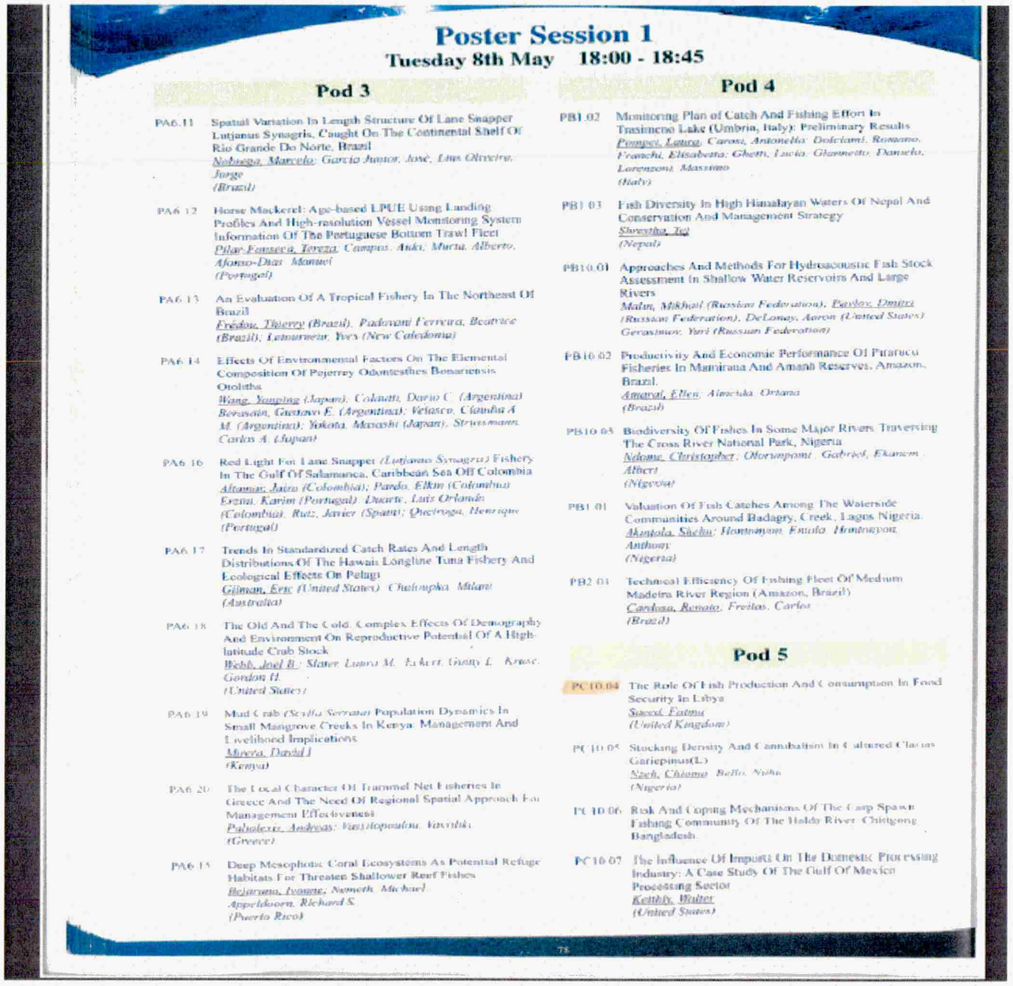
7th - 11th May 2012

Edinburgh, Scotland

Final Programme

6th WORLD FISHERIES CONGRESS EDINBURGH 2012

www.6thwfc2012.com



Poster Session 1

Tuesday 8th May 18:00 - 18:45

Pod 3

PA6.11 Spatial Variation In Length Structure Of Lane Snapper Lutjanus Synagris, Caught On The Continental Shelf Of Rio Grande Do Norte, Brazil
Nobrega, Marcelo; Garcia Junior, José; Lins Oliveira, Jorge
(Brazil)

PA6.12 Horse Mackerel: Age-based LPUE Using Landing Profiles And High-resolution Vessel Monitoring System Information Of The Portuguese Bottom Trawl Fleet
Pilar-Fonseca, Tereza; Campos, Aida; Murta, Alberto; Afonso-Dias, Manuel
(Portugal)

PA6.13 An Evaluation Of A Tropical Fishery In The Northeast Of Brazil
Frédou, Thierry (Brazil); Padovani Ferreira, Beatrice (Brazil); Letourneur, Yves (New Caledonia)

PA6.14 Effects Of Environmental Factors On The Elemental Composition Of Pejerrey Odontesthes Bonariensis Otoliths
Wang, Yanping (Japan); Colautti, Dario C. (Argentina); Berasain, Gustavo E. (Argentina); Velasco, Claudia A M. (Argentina); Yokota, Masashi (Japan); Strüssmann, Carlos A. (Japan)

PA6.16 Red Light For Lane Snapper (*Lutjanus Synagris*) Fishery In The Gulf Of Salamanca, Caribbean Sea Off Colombia
Altamar, Jairo (Colombia); Pardo, Elkin (Colombia); Erzini, Karim (Portugal); Duarte, Luis Orlando (Colombia); Ruiz, Javier (Spain); Queiroga, Henrique (Portugal)

PA6.17 Trends In Standardized Catch Rates And Length Distributions Of The Hawaii Longline Tuna Fishery And Ecological Effects On Pelagi
Gilman, Eric (United States); Chaloupka, Milani (Australia)

PA6.18 The Old And The Cold: Complex Effects Of Demography And Environment On Reproductive Potential Of A High-latitude Crab Stock
Webb, Joel B.; Slater, Laura M.; Eckert, Ginny L.; Kruse, Gordon H.
(United States)

PA6.19 Mud Crab (*Scylla Serrata*) Population Dynamics In Small Mangrove Creeks In Kenya: Management And Livelihood Implications
Mirera, David I
(Kenya)

PA6.20 The Local Character Of Trammel Net Fisheries In Greece And The Need Of Regional Spatial Approach For Management Effectiveness
Paloulexis, Andreas; Vassilopoulou, Vassiliki
(Greece)

PA6.15 Deep Mesophotic Coral Ecosystems As Potential Refuge Habitats For Threaten Shallower Reef Fishes
Bejarano, Ivonne; Nemeth, Michael; Appeldoorn, Richard S.
(Puerto Rico)

Pod 4

PB1.02 Monitoring Plan of Catch And Fishing Effort In Trasimeno Lake (Umbria, Italy): Preliminary Results
Pompei, Laura; Carosi, Antonella; Dolciami, Romano; Franchi, Elisabetta; Ghetti, Lucia; Giannetto, Daniela; Lorenzoni, Massimo
(Italy)

PB1.03 Fish Diversity In High Himalayan Waters Of Nepal And Conservation And Management Strategy
Shrestha, Tej
(Nepal)

PB10.01 Approaches And Methods For Hydroacoustic Fish Stock Assessment In Shallow Water Reservoirs And Large Rivers
Malin, Mikhail (Russian Federation); Pavlov, Dmitri (Russian Federation); DeLonay, Aaron (United States); Gerasimov, Yuri (Russian Federation)

PB10.02 Productivity And Economic Performance Of Pirarucu Fisheries In Mamirauá And Amanã Reserves, Amazon, Brazil.
Amaral, Ellen; Almeida, Oriana
(Brazil)

PB10.03 Biodiversity Of Fishes In Some Major Rivers Traversing The Cross River National Park, Nigeria
Ndome, Christopher; Oforumpomi, Gabriel; Ekanem, Albert
(Nigeria)

PB1.01 Valuation Of Fish Catches Among The Waterside Communities Around Badagry, Creek, Lagos Nigeria.
Akintola, Shehu; Hounnayon, Emula; Hounnayon, Anthony
(Nigeria)

PB2.01 Technical Efficiency Of Fishing Fleet Of Medium Madeira River Region (Amazon, Brazil)
Cardoso, Renato; Freitas, Carlos
(Brazil)

Pod 5

PC10.04 The Role Of Fish Production And Consumption In Food Security In Libya
Saeed, Fatma
(United Kingdom)

PC10.05 Stocking Density And Cannibalism In Cultured Clarias Gariepinus(L.)
Nzeh, Chiamo; Bello, Nisha
(Nigeria)

PC10.06 Risk And Coping Mechanisms Of The Carp Spawn Fishing Community Of The Haldy River, Chittgong Bangladesh.

PC10.07 The Influence Of Imports On The Domestic Processing Industry: A Case Study Of The Gulf Of Mexico Processing Sector
Keithly, Walter
(United States)

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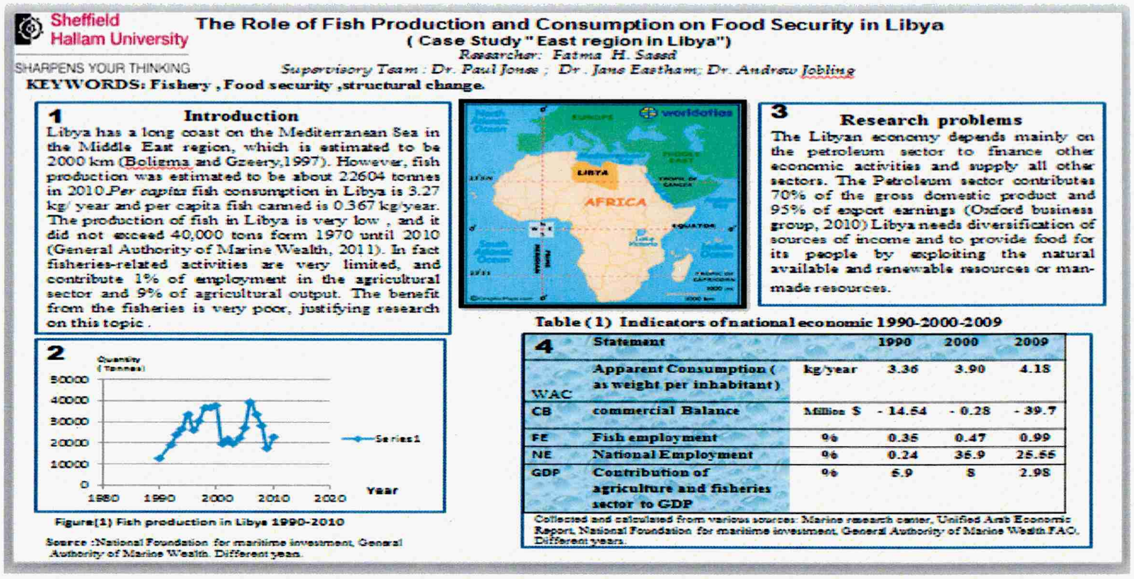


Sheffield Hallam University

SHARPENS YOUR THINKING

The Role of Fish Production and Consumption on Food Security in Libya

(Case Study " East region in Libya")

Researcher: Fatma H. Saeed

Supervisory Team : Dr. Paul Jones ; Dr . Jane Eastham; Dr. Andrew Jobling

KEYWORDS: Fishery , Food security ,structural change.

1 Introduction

Libya has a long coast on the Mediterranean Sea in the Middle East region, which is estimated to be 2000 km (Boliema and Gzeery,1997). However, fish production was estimated to be about 22604 tonnes in 2010.*Per capita* fish consumption in Libya is 3.27 kg/ year and per capita fish canned is 0.367 kg/year. The production of fish in Libya is very low , and it did not exceed 40,000 tons form 1970 until 2010 (General Authority of Marine Wealth, 2011). In fact fisheries-related activities are very limited, and contribute 1% of employment in the agricultural sector and 9% of agricultural output. The benefit from the fisheries is very poor, justifying research on this topic .

3 Research problems

The Libyan economy depends mainly on the petroleum sector to finance other economic activities and supply all other sectors. The Petroleum sector contributes 70% of the gross domestic product and 95% of export earnings (Oxford business group, 2010) Libya needs diversification of sources of income and to provide food for its people by exploiting the natural available and renewable resources or man-made resources.

2

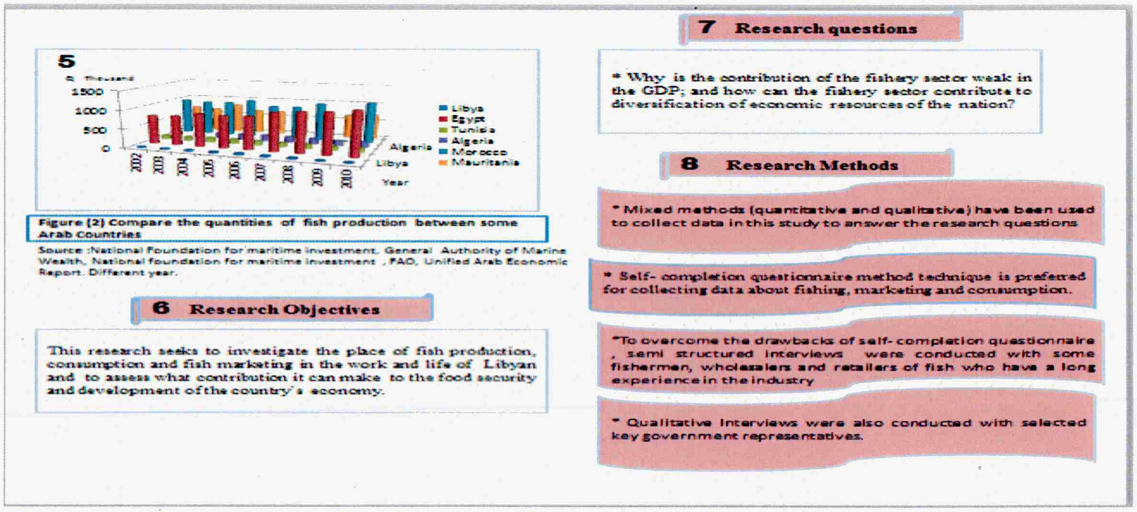
Figure(1) Fish production in Libya 1990-2010

Source :National Foundation for maritime investment, General Authority of Marine Wealth. Different years.

Table (1) Indicators of national economic 1990-2000-2009

4	Statement		1990	2000	2009
WAC	Apparent Consumption (as weight per inhabitant)	kg/year	3.36	3.90	4.18
CB	commercial Balance	Million $	- 14.54	- 0.28	- 39.7
FE	Fish employment	%	0.35	0.47	0.99
NE	National Employment	%	0.24	35.9	25.55
GDP	Contribution of agriculture and fisheries sector to GDP	%	6.9	8	2.98

Collected and calculated from various sources: Marine research center, Unified Arab Economic Report, National Foundation for maritime investment, General Authority of Marine Wealth FAO. Different years.



5

Q Thousand
1500
1000
500
0
2002
2003
2004
2005
2006
2007
2008
2009
2010
Algeria
Libya
Year
Libya
Egypt
Tunisia
Algeria
Morocco
Mauritania

Figure (2) Compare the quantities of fish production between some Arab Countries

Source :National Foundation for maritime investment, General Authority of Marine Wealth, National foundation for maritime investment , FAO, Unified Arab Economic Report. Different year.

6 Research Objectives

This research seeks to investigate the place of fish production, consumption and fish marketing in the work and life of Libyan and to assess what contribution it can make to the food security and development of the country's economy.

7 Research questions

* Why is the contribution of the fishery sector weak in the GDP; and how can the fishery sector contribute to diversification of economic resources of the nation?

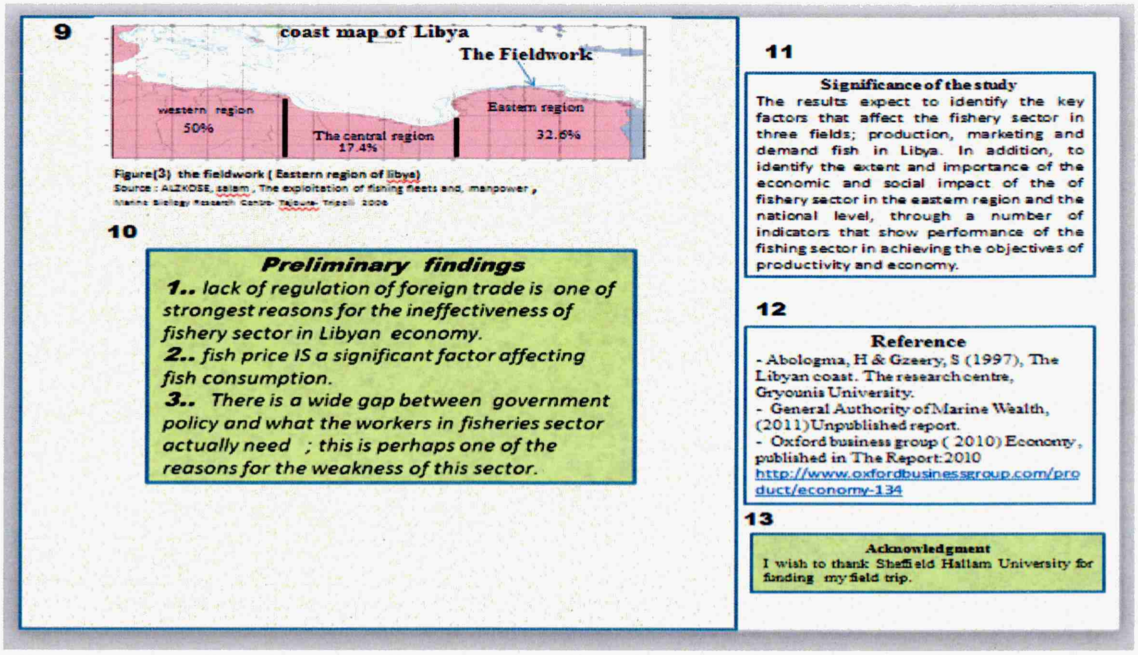
8 Research Methods

* Mixed methods (quantitative and qualitative) have been used to collect data in this study to answer the research questions

* Self- completion questionnaire method technique is preferred for collecting data about fishing, marketing and consumption.

*To overcome the drawbacks of self- completion questionnaire , semi structured interviews were conducted with some fishermen, wholesalers and retailers of fish who have a long experience in the industry

* Qualitative Interviews were also conducted with selected key government representatives.



9

coast map of Libya
The Fieldwork
western region
50%
The central region
17.4%
Eastern region
32.6%

Figure(3) the fieldwork (Eastern region of libya)

Source : ALZKOSE, salam , The exploitation of fishing fleets and, manpower , Marine Biology Research Centre- Tajoura- Tripoli 2006

10 Preliminary findings

***1..** lack of regulation of foreign trade is one of strongest reasons for the ineffectiveness of fishery sector in Libyan economy.*

***2..** fish price IS a significant factor affecting fish consumption.*

***3..** There is a wide gap between government policy and what the workers in fisheries sector actually need ; this is perhaps one of the reasons for the weakness of this sector.*

11

Significance of the study

The results expect to identify the key factors that affect the fishery sector in three fields; production, marketing and demand fish in Libya. In addition, to identify the extent and importance of the economic and social impact of the of fishery sector in the eastern region and the national level, through a number of indicators that show performance of the fishing sector in achieving the objectives of productivity and economy.

12

Reference

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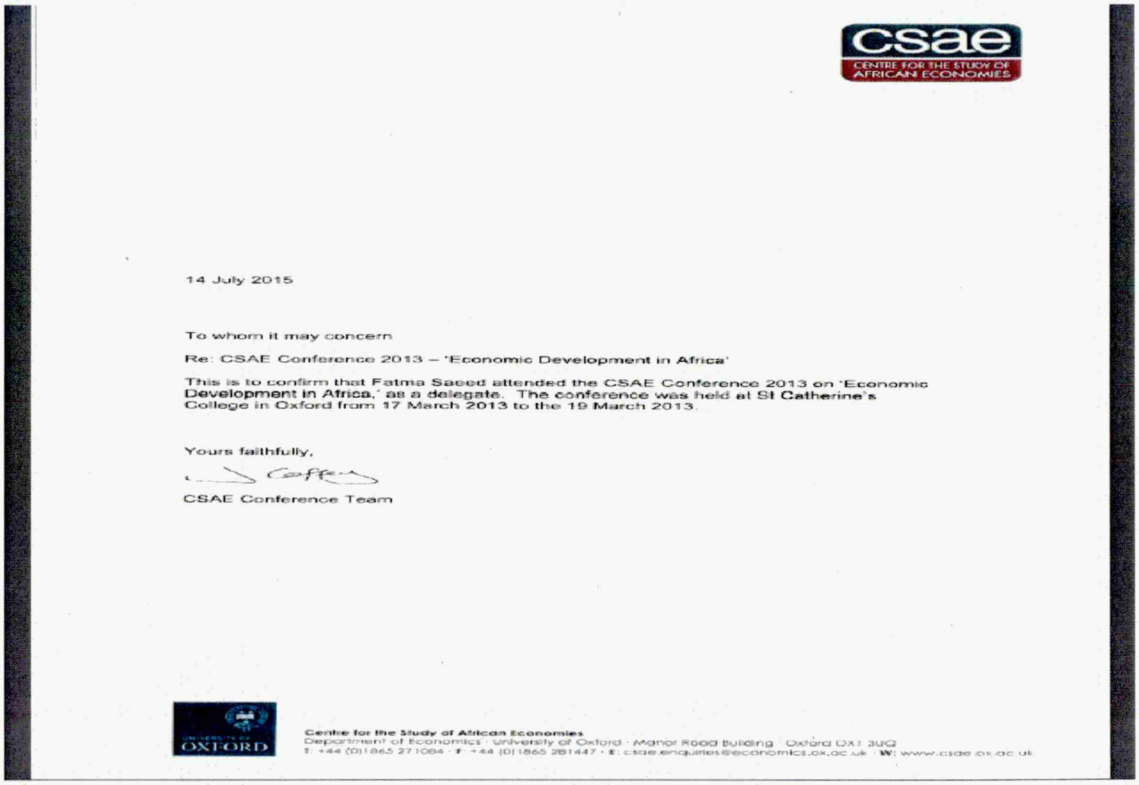
13

Acknowledgment

I wish to thank Sheffield Hallam University for funding my field trip.

Appendix B

CSAE (Centre for the Study of African Economies) Conference for two consecutive years, 2013 and 2014



csae
CENTRE FOR THE STUDY OF AFRICAN ECONOMIES

14 July 2015

To whom it may concern

Re: CSAE Conference 2013 – 'Economic Development in Africa'

This is to confirm that Fatma Saeed attended the CSAE Conference 2013 on 'Economic Development in Africa,' as a delegate. The conference was held at St Catherine's College in Oxford from 17 March 2013 to the 19 March 2013.

Yours faithfully,

Coffey

CSAE Conference Team

UNIVERSITY OF OXFORD
Centre for the Study of African Economies
Department of Economics · University of Oxford · Manor Road Building · Oxford OX1 3UQ
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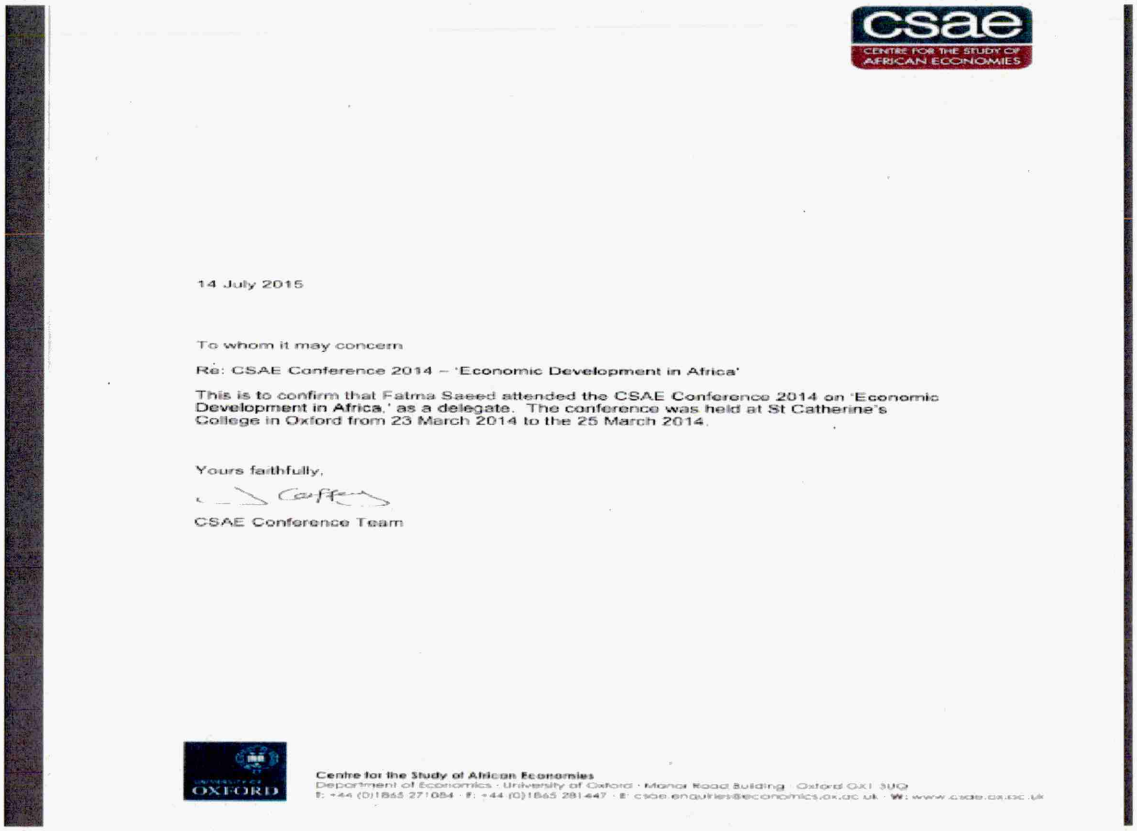

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Appendix C

Table for determining sample size

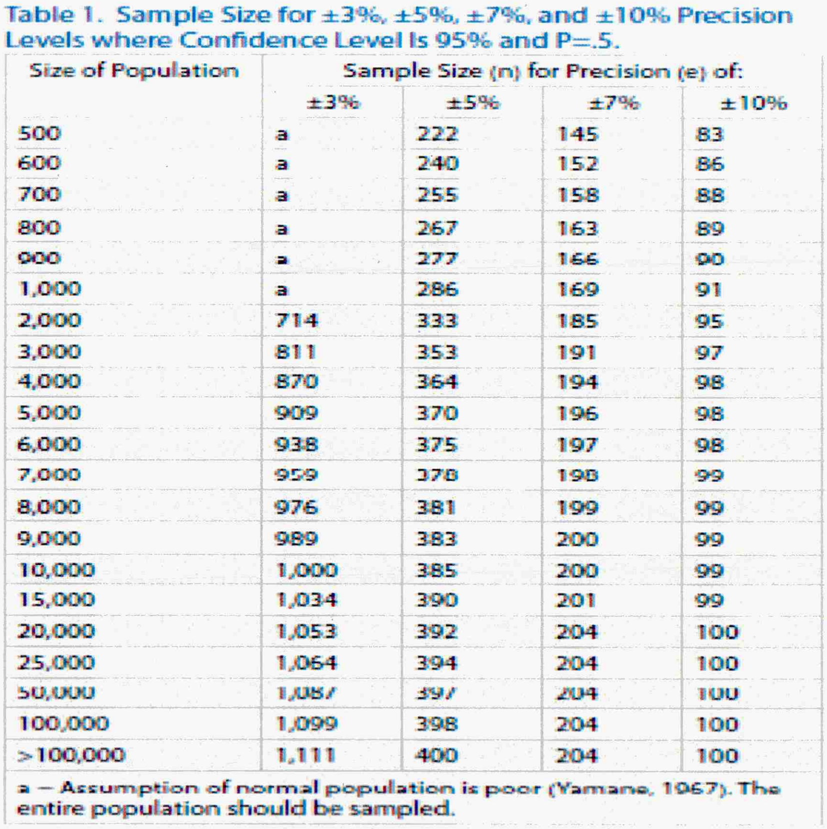


Table 1. Sample Size for ±3%, ±5%, ±7%, and ±10% Precision Levels where Confidence Level Is 95% and P=.5.

Size of Population	Sample Size (n) for Precision (e) of:			
	±3%	±5%	±7%	±10%
500	a	222	145	83
600	a	240	152	86
700	a	255	158	88
800	a	267	163	89
900	a	277	166	90
1,000	a	286	169	91
2,000	714	333	185	95
3,000	811	353	191	97
4,000	870	364	194	98
5,000	909	370	196	98
6,000	938	375	197	98
7,000	959	378	198	99
8,000	976	381	199	99
9,000	989	383	200	99
10,000	1,000	385	200	99
15,000	1,034	390	201	99
20,000	1,053	392	204	100
25,000	1,064	394	204	100
50,000	1,087	397	204	100
100,000	1,099	398	204	100
>100,000	1,111	400	204	100

a = Assumption of normal population is poor (Yamane, 1967). The entire population should be sampled.

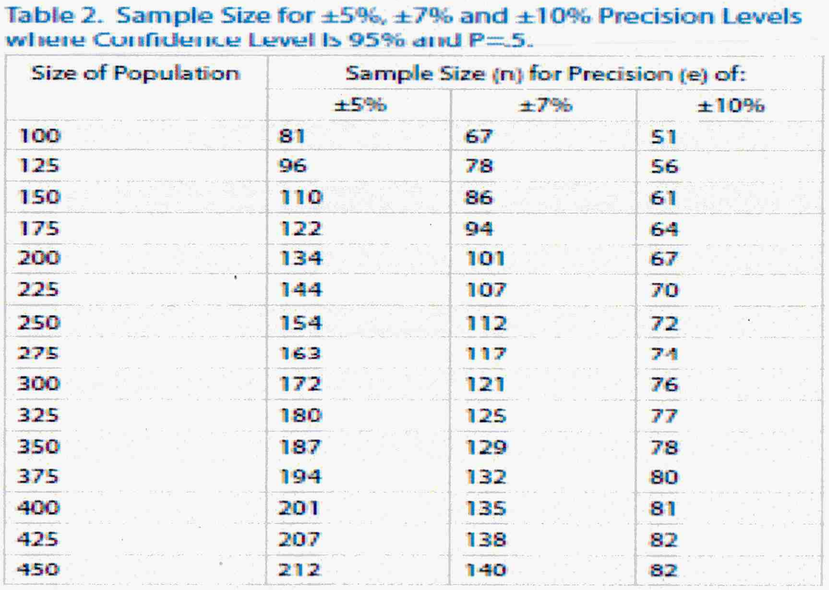


Table 2. Sample Size for ±5%, ±7% and ±10% Precision Levels where Confidence Level Is 95% and P=.5.

Size of Population	Sample Size (n) for Precision (e) of:		
	±5%	±7%	±10%
100	81	67	51
125	96	78	56
150	110	86	61
175	122	94	64
200	134	101	67
225	144	107	70
250	154	112	72
275	163	117	74
300	172	121	76
325	180	125	77
350	187	129	78
375	194	132	80
400	201	135	81
425	207	138	82
450	212	140	82

Source: Israel, 2012: Available at: http://edis.ifas.ufl.edu/pdffiles/pd/pd00600.pdf

Appendix D

English and Arabic Versions of the Fish Production Questionnaire

English Version of the Fish Production Questionnaire

Faculty of Development & Society Graduate School
Unit 9 Howard Street, S1 1WB Sheffield England, United Kingdom

Fisherman (boat owner).Survey Questionnaire

Dear Respondent,

This is a study to carry out fieldwork to collect data for PhD research. The study is about the effect of fish production and consumption on economic development and food security in Libya. The aim is to identify the extent of the contribution of fisheries in the Eastern region of Libya. I would be grateful if you make time to respond to the questionnaire.

All the information you give will be kept completely confidential. Information collected will be used for the study only.

Thanks for your cooperation.

Part 1 Socioeconomic characteristics of fisherman: Tick one option only √

1) Age:

Under 25☐ 1   26-45 ☐ 2   46-60 ☐ 3   over 60 ☐ 4

2) Nationality: Libyan [ ] 1   Egyptian [ ] 2   Tunisians [ ] 3   Others [ ] 4

3) Highest Level of education achieved; **Tick one option only √**

University [ ] 6 Secondary [ ] 5 Preparation [ ] 4 informal [ ] 3 Illiterate [ ] 2 other [ ] 1

4) Do you have a certificate from the Interest Marine Fisheries or received any training in fishing?

Yes [ ] 2   No[ ] 1

5) How many years of experience do you have in this field?

1-10 years ☐ 1   11-20 years ☐ 2   More than 20 years ☐ 3

6) Are you satisfied with your job (fishing)?

Satisfied ☐ 1   Not satisfied ☐ 2

7) Do you have any other source of income? Yes ☐ 1   No ☐ 2

8) Are there co-operative societies in your occupation? Yes [ ] 2   No[ ] 1

If your answer is yes to question 31,

9) Are you a member of the Fishermen's Cooperative society?

Yes [ ]^{2} No[ ]^{1}

10) What is the role of cooperative societies?

PART 2: Type of Boats, fishing methods, and Quantity of fish:

11) What type of boat do you own?

Flouka ☐^{1} Mator ☐^{2} Jarafat ☐^{3} other ☐^{4}

12) How many fishermen work on the boat? [ ]

13) Engine power/ hp [ ]

14) What is your approximate average production per the year? [kg]

15) Is fishing a profitable occupation or do you have losses? I mostly have profit [ ]^{1} I mostly have losses[ ]^{2} Sometimes profit and sometimes losses [ ]^{3}

16) Do you use modern methods of fishing? Yes [ ]^{2} No [ ]^{1}

17) What are the fishing methods used?--

PART 3: Production and Marketing:

18) Which is the best season of the year in terms of abundance and harvest fish?

Winter ☐^{1} Autumn ☐^{2} Summer ☐^{3} Spring ☐^{4}

19) Do you sell the fish to:

The consumer directly ☐^{1} Wholesaler ☐^{2} Retailer ☐^{3} all o☐em^{4} ☐ Other^{5}

20) Do you export your fish directly outside Libya?

21) What are the difficulties during the fishing process from your experience?

Fishing boats:

a- High prices boats [ ]^{1} Lack of spare parts [ ]^{2} The lack of regular maintenance [ ]^{3} all of them [ ]^{4} Other problems [ ]^{5} Please Specify --------------------

b- What is the best solution in your opinion --

----

c- Marketing problems:

The absence of specialized market [ ]1 Lack of means of storage and cooling [ ]2 Lack of marketing clear channels [ ]3 The poor condition of the market handling [ ]4Lower selling fish prices [ ]5 Other problems [ ]6

Please Specify ---
----

d-What is the best solution in your opinion ---
----

e- Employment problems:

Unskilled labour [ ]1 Employment is not available[ ]2 Other problems [ ]3

Please Specify ---

f- What is the best solution in your opinion? --

g- Financing problems:

There is no loans [ ]1 The high cost of loan [ ]2 loans are not widely available [ ]3 Other problems, please Specify --
----

h- What is the best solution in your opinion? --
----

i-Others problems ---

j-What is the best solution in your opinion? ---

PART 4: Government Policies in Relation to Fisheries:

22) Are you satisfied with the role of government in the fishing industries?

Very dissatisfied [ ]1 Dissatisfied [ ]2 Satisfied [ ]3 Very satisfied [ ]4

23) What are the facilities and assistance provided by the State to fishermen?

Provide loans to fishermen [ ]1 Specialized workshops for maintenance of boats [ ]2 Determine the pricing for fish types [ ]3 Attention to the infrastructure of the ports [ ]4

Other facilities [ ]5 ---

24) What should be the government role in the fisheries sector?

……
……
……
……
……………………………………………

Thanks for your cooperation and participation.

Sincerely Yours,

Fatma Saeed, Research Student

Arabic Version of the Fish Production Questionnaire

جامعة شفيلد هلم - المملكة المتحدة

استمارة استبيان عن إنتاج الأسماك

" خاصة بالصيادين(مالك مركب صيد) "

ميناء .... منطقة.......................

هذه الاستمارة تهدف لجمع بيانات لاستكمال بحث دكتوراه حول تأثير إنتاج واستهلاك الأسماك على التنمية الإقتصادية والأمن الغذائي في المنطقة الشرقية ليبيا ، والهدف من البحث هو التعرف على مدي مساهمة مصايد الأسماك في الإقليم الشرقي في ليبيا ، وسأكون ممتنة لو تفضلتم بالإجابة على أسئلة الاستبيان.

*بيانات هذه الاستمارة لا تستخدم إلا في أغراض البحث العلمي وسيتم الاحتفاظ بجميع المعلومات التي يتم جمعها سرية وسوف تستخدم للدراسة العلمية فقط.

شكراً لتعاونكم مسبقا

الجزء الأول/ الخصائص الاجتماعية والاقتصادية للصياد: أختر إجابة واحدة فقط √

1) العمر
أقل من 25 [ ] 1   26 -45 [ ] 2   60-46 [ ] 3   أكثر من 60 [ ] 4

2) الجنسية
ليبي [ ] 1   مصري [ ] 2   تونسي [ ] 3   أخرى [ ] 4

3) ما هو أعلى مستوى تعليم حققته ؟
الجامعة [ ] 6   الثانوي [ ] 5   أعدادي [ ] 4   متعلم من غير شهادة [ ] 3   أمي [ ] 2
أخرى [ ] 1

4) هل لديك شهادة من أي معهد خاص بالصيد البحري أو أي شهادة تدريب في الصيد؟
نعم [ ] 2   لا [ ] 1

5) كم عدد سنوات الخبرة في مجال حرفة الصيد؟
1 -10-سنوات [ ] 1   11- 20 سنه [ ] 2   أكثر من 20 سنه [ ] 3

6) هل أنت راضي على عملك كصياد؟
نعم [ ] 1   لا [ ] 2

7) هل لديك أي مصدر أخر للدخل؟
نعم [ ] 1   لا [ ] 2

8) هل توجد جمعيات للصيد في منطقتك؟

نعم [ ] 1   لا [ ] 2

9) إذا كان جوابك بنعم للسؤال 28 ، هل أنت عضو في أحدى هذه الجمعيات؟

نعم [ ] 1   لا [ ] 2

10) ما هو دور جمعيات الصيد التعاونية إن وجدت؟

الجزء الثاني : قوارب الصيد والدخل المتحصل عليه الصياد :

11) ما هو نوع المركب الذي تعمل عليه:
فلوكه [ ]1 ماتور [ ]2 جرافه [ ] 3 أخرى [ ] 4
12) كم يبلغ عدد الصيادين العاملين على متن القارب؟ [ ]
13) كم تبلغ قوة القارب ؟ [ ]
14) ما هو متوسط حصيلة الإنتاج من الأسماك التي تحصل عليها سنويا ؟ [طن / كجم]
15) هل الصيد مهنة مربحة أو خاسرة بالنسبة لك ؟
أنا غالبا أربح [ ]3 أحيانا أخسر و أحيانا أربح[ ] 2 أنا غالبا أخسر[ ]1

16) هل تستخدم وسائل صيد حديثة؟
نعم [ ] 2 لا[ ]1
17) ما هي طرق الصيد التي تستخدمها في الصيد ؟

الجزء الثالث: الإنتاج والتسويق

18) ما هو أفضل موسم ترتفع فيه حصيلة الصيد؟

الشتاء [ ]^1 الخريف [ ]^2 الصيف [ ]^3 الربيع [ ]^4

19) هل تقوم ببيع الأسماك إلى :

المستهلك مباشرة[ ]^1 تاجر الجملة [ ]^2 تاجر التجزئة[ ]^3 كل من ذكر سابقا [ ]^4
أخرى [ ]^5 أذكرها --
--

20) هل تقوم بتصدير الأسماك خارج ليبيا ؟
نعم [ ]^2 لا [ ]^1

21) ما هي الصعوبات التي تواجهك في عملية الصيد؟

أ- صعوبات متعلقة بمراكب الصيد:

ارتفاع أسعار المراكب [ ]^1 عدم وجود قطع غيار[ ]^2 عدم وجود صيانة دورية[ ]^3
أخرى [ ]^4 تذكر--

- ما هو الحل الأفضل والعملي لأي من هذه المشاكل إن وجدت في رأيك:

ب- مشاكل تسويقية:

غياب السوق المتخصصة [ ]1 الافتقار إلى وسائل التخزين والتبريد [ ]2 عدم
وجود قنوات واضحة للتسويق [ ]3 سوء حالة سوق السمك والمناولة [ ]4 انخفاض أسعار الأسماك
أخرى [ ]5 أخرى [ ]6 تذكر--

- ما هو الحل الأفضل والعملي لأي من هذه المشاكل إن وجدت في رأيك:

ج- مشاكل متعلقة بالعمالة:

عدم توفر العمالة [ ]1 نقص الأيدي الماهرة [ ]2 ارتفاع أجوز العمالة[ ]3

أخرى [ ]4 تذكر--

- ما هو الحل الأفضل والعملي لأي من هذه المشاكل إن وجدت في رأيك:

د- مشاكل تمويلية:

عدم توفر قروض [ ]1 ارتفاع تكلفة القرض [ ]2 عدم وجود قروض [ ]3

أخرى [ ]4 تذكر--

- ما هو الحل الأفضل والعملي لأي من هذه المشاكل إن وجدت في رأيك:

سياسة الدولة تجاه قطاع الأسماك:

22) هل أنت راض عن الدور الذي تقوم به الدولة تجاه قطاع الثروة البحرية ومصائد الأسماك ؟

مستاء جدا[ ]1 غير راضي [ ]2 راضي [ ]3 راضي جدا[ ]4

23) ما هي التسهيلات والمساعدات التي تقدمه الدولة للصيادين؟

تقديم قروض للصيادين [ ]1 ورش عمل متخصصة لصيانة القوارب [ ]2 تحديد الأسعار بالنسبة
لأنواع الأسماك [ ]3 الاهتمام بالبنية التحتية لمرافئ وموانئ الصيد [ ]4
تسهيلات وخدمات الأخرى [ ]5

24) ما هو الدور الذي ينبغي أن تقوم به الحكومة تجاه قطاع الأسماك في رأيك؟

شكراً لتعاونكم
وتفضلوا بقبول فائق الأحترام

فاطمة محمد

Appendix E

Interview Cover Sheet and Participant Consent Form

Sheffield Hallam University

Faculty of Development & Society Graduate School
Unit 9 Howard Street, S1 1WB Sheffield, England, United Kingdom
Email contact: fatmasaeed2012@yahoo.co.uk
To:......................................

Project Description / Request for Interview Permission

Dear Sir/Madam

My name is Fatma Saeed, a PhD student at Sheffield Hallam University, Sheffield, England, UK. My thesis is related to the fisheries sector in the eastern region of Libya. For the purpose of obtaining data for my study, I am currently undertaking field research and would therefore like to ask your permission to carry out an interview with you.

The data collected from the interview will be used for the purpose of my thesis and academic articles that may result from it. For ease of transcription and analysis, I would like to record the interview on tape but only if you do not object. At the end of the analyses, your responses will be completely deleted from the recording device. As a respondent, your name will not appear in my thesis nor there any references/indications that may point to or reveal your identity. If you would like to hear about the results of the study, I will be happy to receive your contact information on the day of interview and contact you in due course. If you have any questions related to the research, please feel free to contact me on the address provided above.

I will be greatly thankful if you decide to participate in the interview.

Yours sincerely

Fatma saeed

Research Student

Agreed & accepted by.................

Signature...............Date.............

Title.......................................

Appendix F

English and Arabic versions of the fish production Interview

English Version of the Fish Production Interview

Interview with a Fisherman (Fish Production)

1. The process of fishing needs many resources (boats, fishing gear, bait, ice .... etc.), how do you obtain such resources and where do you purchase them from e.g. individual members or with help from the government. Are the prices suitable for the fisherman and are is there any insurance on fishermen equipment such as fishing boats? Are there any taxes that fishermen have to pay?

2. When catching the fish and bringing it to their landing sites (harbors), what are the operations carried out by the fishermen before distributing their produce and who collects the fish?

3. How is the fish priced and who prices it?

4. Is ice readily available in harbors and are there any ice factories near the harbours? Are means of transportation available and suitable in terms of the degree of cooling needed for preserving fish?

5. Is the infrastructure of the ports suitable? Are there any special resorts for the fishermen at the harbour (rest rooms or the like)? What in your opinion does the east coast lack?

6. Is fish sold only in a fresh form or is there anyone who salts and dries it before selling it in the markets? Are there any canning factories which receive the excess production? What happens to the remaining quantity of the produce when it is not sold in full? Are there any street vendors?

7. Do fishermen use any type of modern machinery in fishing or any type of technology?

8. Please describe in detail the process of transfer of fish from the hand of the fisherman until it reaches the final consumer?

9. Is there any export of fish from Libya? And if there is, how and to which countries is it exported?

10. Are the laws related to fishing suitable or not? And why?

11. What is the role of the state in improving the fishing activity and helping the fishermen?

12. Do you have anything to add?

Arabic Version of the Fish Production Interview

مقابلة (إنتاج الإسماك) مع صياد

السلام عليكم ورحمة الله وبركاته

س1 عملية صيد الأسماك تحتاج إلى العديد من المدخلات(قوارب ، أدوات صيد ، طعم ، ثلج .... الخ) كيف تحصلون عليها وما هي الجهة التي تشترونها منها ، هل هم أفراد أو بمساعدة من الدولة ، وهل الأسعار مناسبة للصياد؟ وهل يوجد تأمين على معدات وقوراب الصيادين؟ وهل توجد ضرائب على الصيادين؟

س 2 عند إصطياد الأسماك وجلبها إلى مواقع الهبوط (المرافئ) ماهي هي العمليات التي يقوم بها الصياد قبل البدء في توزيع وبيع إنتاجه ؟ ومن يقوم بجنمع الأسماك

س3 كيف يتم تحديد اسعار الأسماك ؟ ومن يقوم بذلك؟

س4 هل يتوفر الثلج بسهولة في المرافئ وهل توجد مصانع ثلج قريبة من المرافئ ، وكذلك وسائل نقل هل متوفرة و مناسبة من حيث درجة التبريد التي تحتاجها الأسماك ؟

س5 هل البنية التحتية للمرافئ مناسبة ؟ هل توجد إي أستراحات خاصة بالصيادين على المرفأ (غرف للإستراحة أو ما شابه ذلك) ؟ وما الذي ينقص المرافي في الساحل الشرقي من وجهة نظرك؟

س6 هل تباع الأسماك فقط في صورة طازجة أم هناك من يقوم أيضا بتملحيها أو تجفيفها قبل بيعها للأسواق ؟ وهل هناك مصانع تعليب تستقبل الزائد من إنتاجكم ؟ في حالة عدم بيعكم للأنتاج ما هو مصير الكمية المتبقية؟ هل هناك باعة متجولين؟

س7 هل يستخدم الصياديون أي نوع من الألأت الحديثة في عملية الصيد أو أي نوع من التكنولوجيا ؟

س 8 أرجو أن تصف لنا بالتفصيل عملية إنتقال االأسماك من يد الصياد حتى تصل إلى المستهلك النهائي؟

س9 هل هناك أي تصدير للأسماك خارج ليبيا ؟ وإذا كانت كيف تتم وإلى أي دولة يتم تصديرها ؟

س10 هل القوانين الخاصة بالصيد مناسبة أم لا؟ ولماذا ؟

س11 ما هو دور الدولة في تحسين نشاط صيد الأسماك ومساعدة الصيادين؟

س 12 هل لديك أي إضافة؟

شاكرين حسن تعاونكم

English and Arabic Versions of the Fish Vendors Interviews

Interview with Fish Wholesaler

1. Can you tell us about the fish trade in Libya?

2. How do you evaluate the local fish trade in Libya? In other words, what is your opinion about the local fish trade in Libya?

3. Can you describe or identify the fish marketing channels in Libya?

4. From where do you usually purchase the fish?

5. How is the pricing performed?

6. What are the challenges facing local marketing of fish in Libya?

7. Could you give us a clear picture of the demand for fish by consumers in Libya?

8. Do you export fish? Do you import fish from outside Libya?

Do you have anything to add?

Arabic Version of the Fish Vendors Interviews

مقابلة مع تاجر جملة أسماك

س1هل تستطيع أن تحدثنا عن تجارة الأسماك في ليبيا؟

س2 كيف تقيم تجارة الأسماك المحلية في ليبيا ؟ بمعنى أخر ما هو رأيك في تجارة الأسماك المحلية في ليبيا ؟

س3 هل يمكن وصف أو تحديد قنوات تسويق الأسماك في ليبيا؟

س4 من أين تقوم عادة بشراء الأسماك؟

س5 كيف يتم وضع الأسعار ؟

س6 ما هي التحديات التى تواجه التسويق المحلي للأسماك في ليبيا ؟

س7 هل يمكن أن تعطينا صورة واضحة للطلب على الأسماك من قبل المستهلكين في ليبيا؟

س 8 هل تقوم بتصدير الأسماك إلى خارج ليبيا؟ هل تقوم باستيراد الأسماك من خارج ليبيا؟

هل لديك أي إضافة

English Version of the Interview with a Fish Retailer

Interview with a Fish Retailer

I will use the data obtained through this interview to complete the PhD research on the impact of the production and consumption of fish on economic development and food security in Libya. One of its objectives is to describe and evaluate the marketing of fish in Libya, and I will be grateful for your cooperation if you agree to participate in the provision of evidence to support this study. I ensure that this data will only be used for the purpose of scientific research and will be kept fully confidential.

1. Can you tell me your nationality, please? Are you personally interested in this profession and is fish trade a primary or secondary career for you?

2. What means do you use to display and sell fish? For example, do you own a shop in the market or have a vehicle or any other way?

3. What is your level of knowledge in ways of preserving fish so that it is in a condition sufficient for consumption after they get caught? In other words is the level of knowledge you have is very good or weak etc?

4. Do you own a car dedicated to keeping fish during transport to and from the store? Is there a refrigerator for keeping the fish inside the shop? Do you easily obtain the ice used to preserve the fish?

5. From which sources do you the buy fish which then you sell yourself to the consumer? Is it directly from a fisherman or a dealer or any other entity? Who do you sell the fish to?

6. Is there any special market for wholesalers to sell the fish to retailers in the city in which they reside?

7. Do you provide any services in addition to selling the fish in your shop? What type of services do you offer?

8. What is the best season of the year for selling fish for retailers?

9. To what extent do you think the consumption of fish contributes in to providing the Libyan consumer with protein alongside other meats such as beef, lamb/mutton and chicken?

10. What are the problems facing the marketing of fish from your point of view?

11. How effective is the government's role in controlling/monitoring the marketing of fish? To what extent do you agree that the state's policy toward fish trade is the main reason for the problems faced by traders?

12. How do you evaluate the policy followed in local fish trade in Libya?

13. What are your suggestions for local fish trade so that it has an essential role in contributing to food security and economic development in Libya?

Arabic Version of the Fish Vendors Interviews

مقابلة مع تاجر تجزئة

جامعة شفيلد هلم – المملكة المتحدة

موضوع الدراسة: تأثير إنتاج واستهلاك الأسماك

مقابلة مع تاجر أسماك تجزئة - على الإقتصاد الليبي و الأمن الغذائي في ليبيا

السيد المحترم

سوف تستخدم البيانات المتحصل عليها من خلال هذه المقابلة لاستكمال بحث دكتوراه حول تأثير إنتاج واستهلاك الأسماك على التنمية الإقتصادية الأمن الغذائي في ليبيا . ومن ضمن أهدافه وصف وتقييم تسويق الأسماك في ليبيا ، و سوف أكون ممتنة لتعاونكم لو تفضلتم ووافقتم على المشاركة في توفير بينات لدعم هذه الدراسة. مع العلم هذه البيانات تستخدم فقط لغرض البحث العلمي وسوف يتم الاحتفاظ بسرية المعلومات بشكل تام.

س1 : هل بالإمكان أن نتعرف على جنسيتك لو سمحت ، وهل أنت مهتم شخصيا بهذه المهنة وهل تجارة الأسماك بالنسبة لك مهنة رئيسية أو ثانوية؟

س2 : ما هي الوسيلة التي تستخدمها لعرض وبيع الأسماك؟ على سبيل المثال محل في السوق أو لديك سيارة متنقلة أو أي وسيلة أخرى؟

س3 : ما هو مستوى معرفتك بطرق حفظ الأسماك لتكون في حالة جيده للاستهلاك بعد اصطيادها؟ بمعنى ما هو مستوى المعرفة لديك بهذا الجانب جيد جدا أو ضعيف الخ ؟

س4: هل تمتلك سيارة مخصصة لحفظ الأسماك أثناء نقلها من وإلى المحل ؟ هل توجد ثلاجة لحفظ الأسماك داخل المحل؟ هل تحصل على الثلج المستخدم لحفظ الأسماك بسهولة؟

س5: من أي من مصدر تقوم بشراء الأسماك والتي بدورك تقوم ببيعها إلى المستهلك؟ هل من الصياد مباشرة أو تجار او أي جهة أخرى؟ وما هي الجهة التي تقوم ببيع الأسماك لها؟

س6 : هل هناك أي سوق يتجمع فيه تجار الجملة لبيع الأسماك لتجار التجزئة في المدينة التي يقيم فيها؟

س7 : هل تقوم بتوفير أي خدمات بالإضافة لبيع السمك في المحل الخاص بك؟ما هو نوع هذه الخدمات التى تقوم بها؟

س 8 ما هو أفضل فصل من فصول السنة لبيع الأسماك بالنسبة لتجار التجزئة ؟

س9 إلى أي مدى تعتقد أن الأسماك لها مساهمة مهمة مع باقي اللحوم الأخرى مثل لحوم الأبقار والأغنام والدجاج لتزويد المستهلك الليبي بالبروتين ؟

س10 ما هي المشاكل التي تواجه تسويق الأسماك من وجهة نظرك؟

س 11 ما مدى فعالية دور الحكومة في الرقابة على تسويق الأسماك ؟ إلى أي مدى توافقون على أن سياسة الدولة تجاه تجارة الأسماك هي السبب الرئيسي للمشاكل التي تواجه التجار؟

س 12 كيف تقيمون السياسة المتبعة في تجارة الأسماك المحلية في ليبيا

س 13 ما هي اقتراحاتك لتحسين تجارة الأسماك المحلية من أجل أن يكون لها الأثر الفعال في المساهمة في تحقيق الأمن الغذائي وبالتالي التنمية الاقتصادية في ليبيا؟

Appendix G

English and Arabic Versions of the Demand (Fish Consumption) Questionnaire *English Version of the Questionnaire*

Faculty of Development & Society Graduate School,
Unit 9 Howard Street, S1 1WB Sheffield, England, United Kingdom

Fish Consumption Survey

Dear Respondent,

This is a study to carry out fieldwork to collect data for PhD research. The study is about effect of fish production and consumption on food security in Libya, The aim is to identify the extent of the contribution of fisheries to food security in Libya. I would be grateful if you could make time to respond to the questionnaire.

All the information you give will be kept confidential. Information collected will be used for the study only.

Thanks for your cooperation.

PART 1

Section A: Demographic factors

1) Name of the city: ____________________________

2) Age:

Under 25 ☐ 1 26-45 ☐ 2 46-60 ☐ 3 over 60 ☐ 4

3) Gender:

Male ☐ 2 Female ☐ 1

4) What is the highest level of education reached by the main provider in your home?

University and above ☐ 6 Secondary ☐ 5 Primary ☐ 4 informal ☐ 3
Illiterate ☐ 2 Other ☐ 1 Please Specify ---

5) Family size

1-2 persons [ ] 1 3-4 persons [ ] 2 5-6 persons [ ] 3 7-8 persons [ ] 4 more than 8 [ ] 5

6) Number of children under the age of 16 years in household

0 Child ☐ 1 1-2 Children ☐ 2 3-4 Children ☐ 3 5-6 Children ☐ 4

More then 6☐ 5

8) Family income per month

Less than 300 D [ ]1 300-600 D [ ]2 601- 900 D [ ]3 901 D or more [ ]4

Section B: Social - habits - cultural factors

9) What type of protein do you usually eat?

Lamb ☐ 1 beef ☐ 2 chicken ☐ 3 fish ☐ 4 camel ☐ 5 other ☐ 6

10) Do you think that the population of your city prefer a certain type of meat?

Yes ☐ 1 No ☐ 2

11) If your answer yes to question10, what is the preferred type?

Lamb ☐ 1 beef ☐ 2 fish ☐ 3 chicken ☐ 4 camel ☐ 5 other ☐ 6

12) Do you eat fish? Yes ☐ 2 No ☐ 1

13) If your answer no to question12, what is the reason you don't eat fish?

I do not like fish [ ]1 Not readily available [ ]2

Fish is not easy to prepare at home [ ]3 Fish is expensive compared with other meats [ ]4 Other reasons [ ]5 Please Specify --

14) If your answer yes to question12, how often do you eat fish?

Tick one option only √

Once during the season (four months) almost [ ]1 once a month [ ]2 1-2 times per month [ ]3 3-4 times per month [ ]4 never [ ]5 Other----

15) Which type of species do you eat most? --------------------------------

16) Do you eat processed (tinned) fish?

Tuna ☐ 1 Sardines ☐ 2 Salmon ☐ 3 all of them ☐ 4 Other ☐ 5 Please Specify ---------------

17) Are there any cultural barriers to preparing fish meal for your guests?

Yes ☐ 1 No ☐ 2

18) If your answer yes to question 17, what is the cause?

Section C: Psychological Factors:

Convenience:

19) Do you think that fish meals are easy to prepare?

Yes ☐ 1 No ☐ 2

Mood

20) Do you think that eating fish helps cope with stress?

Yes ☐ No ☐ 2

Health

21) Do you feel that eating fish meal keeps you healthy?

Yes ☐ 1 No ☐ 2

22) Do you have knowledge of the nutritional value of fish?

Yes☐ 1 No ☐ 2

Section D: Economic factors

23) Do you think that the price of fish is a fordable on your income?

Yes ☐ 1 No☐ 2

24) Are the fish is available in stores in the city where you live?

Yes ☐ 1 No☐ 2

25) Which factors do you believe influence your purchasing of fish for home consumption?

factor	very important 1	important 2	somewhat important 3	somewhat Not important 4	Not important 5	Not at all important 6
quality						
taste						
nutritional value						
convenience (prepare)						
availability						

price						
health						

Part 2

In this section; I would like to have your personal views on issues regarding increasing the contribution of fisheries to food security.

27) What are the obstacles that prevent fish from being an important meal in the Libyan society?

----

28) Do you have any suggestions that may help to take this type of protein more important in the Libyan diet?

Arabic Version the Questionnaire

استمارة استبيان عن استهلاك الأسماك

بمدينة ....

هذه الدراسة الميدانية لجمع بيانات بهدف إستكمال بحث دكتوراه حول تأثير إنتاج واستهلاك الأسماك على الأمن الغذائي في ليبيا ، والهدف من البحث هو التعرف على مدي مساهمة مصايد الأسماك في الأمن الغذائي في ليبيا ، وسأكون ممتنة لو تفضلتم بالإجابة على أسئلة الاستبيان.

*بيانات هذه الاستمارة لا تستخدم إلا في أغراض البحث العلمي وسيتم الاحتفاظ بجميع المعلومات التي يتم جمعها سرية وسوف تستخدم المعلومات التي يتم جمعها للدراسة العلمية فقط.

الجزء الأول /العوامل الديموغرافية:

1) أسم المدينة : ....
2) العمر: [ ]
3) الجنس : ذكر [ ]^{2} أنثى [ ]^{1}

4) ما هو أعلى مستوى تعليم الذي وصل إليه عائل الأسرة ؟

الجامعة وما فوق [ ]^{6} الثانوية [ ]^{5} الإعدادية [ ]^{4} الابتدائي [ ]^{3} أمي [ ]
^{2} متعلم من غير شهادة[ ] ^{1}

5) حجم العائلة [ ]

6) ما هو عدد الأطفال في الأسرة الذين أعمارهم أقل من 16 [ ]
7) كم يبلغ دخل الأسرة في الشهر؟[ ]

العادات والعوامل الثقافية والاجتماعية:

8) ما هو نوع البروتين الذي عادة تتناوله أسبوعيا ؟

لحم الضأن [ ]^{1} لحم البقر[ ]^{2} الدجاج[ ]^{3} الأسماك[ ] ^{4} لحم الإبل[ ]^{5}
أخرى[ ]^{6}

9) هل تعتقد أن سكان مدينتك يفضلون تناول نوع معين من اللحوم ؟

نعم [ ]^{1} لا[ ]^{2}

10) لماذا

لا تفضل أي نوع[ ]^{1} رخيص [ ]^{2} عادات وتقاليد [ ] ^{3} مذاقه لذيذ[ ]^{4}

11) إذا كانت الإجابة على السؤال 9 بنعم ، ما هو النوع الذي يفضلون تناوله ؟

لحم الضأن [ ]^{1} لحم البقر[ ]^{2} الدجاج[ ]^{3} الأسماك[ ] ^{4} لحم الإبل[ ]^{5}
أخرى[ ]^{6}

12)هل تتناول الأسماك؟

نعم[ ]1 لا [ ]2

12) إذا كانت الإجابة بلا على السؤال 11 ، فما هي سبب عدم الأسماك ؟

- أنا لا أحب الأسماك [ ]1 الأسماك غير متوفرة ومتاحة بسهولة [ ]2
- وجبة الأسماك ليست سهلة الأعداد في المنزل [ ]3 الأسماك غالية السعر مقارنة مع اللحوم الأخرى[ ]4 أسباب أخرى [ ]5 الرجاء التحديد --

----

إذا كان الإجابة بنعم على السؤال 11 ، كم مرة تتناول الأسماك؟

أختر إجابة واحدة فقط

أقل من مرة في الشهر [ ]1 مرة واحدة في الشهر [ ]2 1-2 في الشهر [ ]3

4-3 مرات في الشهر [ ]4 أسبوعيا [ ]4 غالبا أتناول الأسماك [ ]5 لا أعرف[ ]6

13) ما هي الأنواع المفضلة من الأسماك بالنسبة لك (حدد نوع أو أكثر)؟

-------- ---

14) هل تتناول أحدى منتجات الأسماك المعلبة الآتية ؟

- التونة [ ]1 السردين [ ]2 سلمون [ ]3 أخرى [ ]4

15) هل هناك إي حواجز ثقافية في بيئتك لتقديم وجبة الأسماك لضيوفك؟

نعم [ ]1 لا[ ]2

16) إذا كانت الإجابة بنعم للسؤال 16 ، ما هو السبب؟

العوامل النفسية :

الراحة

17) هل تعتقد أن وجبة الأسماك سهلة التحضير؟

نعم [ ]1 لا[ ]2

المزاج:

18) هل تعتقد أن تناول السمك يساعد على التخلص من الضغط النفسي؟

نعم [ ]1 لا[ ]2

الصحة:

19) هل تعتقد أن تناول الأسماك يحافظ على صحتك؟

نعم [ ]1 لا[ ]2

21) هل لديك معرفة بالقيمة الغذائية للأسماك؟

نعم [ ]1 لا [ ]2

العوامل الاقتصادية:

22) هل تعتقد أن أسعار الأسماك مناسبة لدخلك؟
نعم [ ]^1 لا[ ]^2
23) ما هو مقدار إنفاقك الشهري على الأسماك؟ [ ]

24) هل الأسماك متاحة في الأسواق والمتاجر الموجودة في المدينة التي تعيش فيها؟

نعم [ ]^1 لا[ ]^2

25) ما هو مدى تأثير العوامل الآتية في اعتقادك على شراء الأسماك لاستهلاكها في المنزل ؟

العامل	مهم جدا 1	مهم 2	إلى حد ما مهم 3	إلى حد ما ليس مهم 4	غير مهم 5	غير مهم على الإطلاق 6
الجودة						
الطعم						
القيمة الغذائية						
الراحة (سهولة أعداد الوجبة)						
توفرها						
السعر						
الصحة						

الجزء الثاني:

في هذا الجزء أود أن أستطلع بعض الآراء الشخصية حول القضايا المتعلقة بزيادة مساهمة مصائد الأسماك في الأمن الغذائي.

26) من وجهة نظرك ما هي العقبات التى تمنع أن تكون وجبة الأسماك وجبة مهمة في المجتمع الليبي؟

----

27) هل لديك أي اقتراحات يمكن أن تساعد في أن يكون هذا النوع من البروتين له أكثر أهمية في النظام الغذائي للمجتمع الليبي ؟

Appendix H (1)

English and Arabic Versions of the Government-related Interviews and Samples of an Interview Schedules

English Version of the Government-related Interview

1- How do you see the fish industry in Libya?

2-What is the reason for the lack of fish production in Libya as annual fish production has not so far exceeded 40,000 tonnes?

3- Why does not Libya export fish directly to European countries, rather than through Tunisia?

4- To what extent do you feel that the government has realized its plans in the field of fisheries? Has it recognised the importance of fisheries?

5-Do you believe that in the future the fisheries sector could support the oil sector in the financing of other sectors?

6-What is the reason for the lack of fish in the diets of most Libyan citizens?

7- Would you like to add any information related to the subject?

Thank you very much for giving us your time

Arabic Version of the Government-related Interviewة.

س1 كيف ترى صناعة أو قطاع الأسماك في ليبيا ؟

س2 ما هي أسباب ضعف الإنتاج السمكي في ليبيا حيث إن إنتاجها من الأسماك لم يتجاوز 40000 طن حتى ألآن؟

س3 لماذا تصدير الأسماك الليبية لا يتم مباشرة إلى الدول الأوروبية ، بدلا من تصديرها من خلال تونس أولا؟

س4 ألى أي مدى تعتقد إن الحكومة تدرك أهمية قطاع الأسماك ؟ وهل تلاحظ مدى أهمية الثروة السمكية؟

س5 هل تعتقد أنه في المستقبل إن قطاع الثروة السمكية يمكن أن يكون مساندا لقطاع النفط في دوره في التنمية الإقتصادية ودعم الإقتصاد؟

س6 ما هي الأسباب وراء قلة وجود الأسماك في وجبات المواطنين الليبين ؟

س7 هل تود أن تضيف أي معلومات متعلقة بهذا الموضوع؟

شكرا جزيلا على إعطائك لنا جزء من وقتك

Sample of an Interview Schedule with Government Official

1- How do you see the fish industry or sector in Libya?

The fisheries sector in Libya does not contribute effectively to the Libyan economy because of the weakness of its capabilities: for example, fishing ports along the Libyan coast suffer from a lack of infrastructure. But we are seeking to make the fisheries sector one of the important sectors, which take priority in the production sector; this will help provide jobs for many job seekers. We are also working to create a business boom, because the material [fish] is needed as food for the Libyan people, for export, and to raise the level of the national economy and to lift the average income level. Fisheries could contribute to the level of general income The focus of the three or four year plan that ended in 2010 was to develop the fisheries sector to ensure strong industries for fishing This plan included the preparation of a basic environment for fishing. This plan, or the environment it prepared, was based on the establishment of more than 30 ports, with fishing integrated with sidewalks, stores, refrigeration and quality and chemical control of the fish produced or the daily catch. The plan also embraced markets and documentation of produced quantities; it then moved it on to ensure that everything was carried out in accordance with internationally accepted methods and standards that met European and global levels.

2-What are the reasons for the lack of fish production in Libya as the annual fish production has so far not exceeded 40,000 tonnes?

The lack of basic infrastructure, as I said, there is no infrastructure for fishing. In other words, there are no places for boats along the coast. If we examine the eastern region from Pardy to the port of Benghazi, no real fishing port exists. Some ports have just started working such as the port of Sousse and the port of Ras al-Hilal, and there are new docks at the port of Tobruk. The port at Almrise is the one of the largest ports in the eastern regions. Also in the western region; many ports such as Sirte, Misurata, Qara, Polly, Komas,Tajura, Tripoli, Nook, Janzour, Sabratha and Zwora, in none of these places is there one port suitable for fishing. There is now a port of Sirte which will soon come into operation and the port of Misurata,. And the port in Alkarobolli will be opened in a month or two, and be ready to work. The lack of infrastructure is the only obstacle facing fishermen; it means that there is no infrastructure. There was no programme for large companies to come and enter the ports, start working hard and get on with production. I am sure that, when nine of these ports are completed, besides the other three ports whose contracts have been signed, almost 12 ports will double their production to more than 40,000 tons, which is a good figure. The annual production of fish should not be less than 100,000 tons per year. 100,000 tons will certainly result in a boom in the entire region and not only the market in Libya.

3- Why doesn't Libya export fish directly to European countries, rather than through Tunisia?

The big problem is there is no agreement with the European Union with regard to standards and in terms of quality of methods pertaining to fisheries. One of the criteria required to enter Libyan fish is infrastructure, also information on fishing methods. Now, there are committees such as the Union organization from Alonfosmk and Aliikad which examine existing fishing methods and determine to what extent the global standards in fisheries sector exist. I think that the result in the last report was that Libya is not a rogue with respect to fishing. The second point is that the infrastructure which we have started work to establish has now begun to have an impact; therefore, fish produced is healthy fish according to the criteria of the veterinary health control. There is also little pollution in the region according to studies at the Centre for Marine Fish with the FAO, because they did some studies on pollution. And the Libyan coast is one of the coastlines less affected by environmental contamination. Also all these things, norms and standards if signed with the EU will directly enable our products to enter markets. But now fish are exported to Tunisia and Egypt. Now, there are committees of the Union Organization from Alonfosmk tasked with examining fishing methods and determining to what extent Libya conforms to them. I think that the last report revealed that Libya applies global sea fishing conditions and that it is not a rogue in respect to fishing. Also I would like to say that the Libyan beach is one of the beaches less affected by environmental contamination of fish.

4- To what extent do you feel that the government realized its plans in the field of fisheries? Has it recognised the importance of fisheries?

They are a great benefit to our total revenue in the national economy. However, investment in marine wealth is still considered weak compared to other countries in the region. The attention and focus is on taking advantage of the wealth of fish that has begun to attract notice in Libya recently. Consequently, domestic investment has evolved and increased dramatically. Foreign investment is still very limited in this area. Furthermore, legislation, laws and regulations with regard to fisheries and fishing as well as marketing and distribution of fish and fish products can be considered as the second pillar of the success of investment in the fisheries sector. They help build a strong fish industry. However, the legislation governing fishing in Libya is one of the obstacles that hinders the success of investment in marine fisheries.

5-Do you believe that in the future the fisheries sector could support the oil sector in the financing of other sectors?

If the building of the basic infrastructure is completed, and work has now started, there should soon be nine completed ports for fishing with all facilities integrated into the fishermen's villages, markets, docks and all the things fishermen need, and also the marine surveys should soon be completed, Furthermore, an estimation of quantities produced and the types of fish should be completed, along with the development and improvement of bays. We also for look at the development of fish farming in ponds, both within and outside the sea, also fish product development and the preservation of fish quality and quality: all these things will operate to raise the level of the economy and, in addition, raise the total output of fish production. This will be reflected in higher income levels. We know that more than 95% of our income comes from oil revenue, which is the primary resource; and all other sectors contribute in the range of 5%, sometimes a little more, sometimes less; but fishing, tourism as well as some other industries that could add no less than 15% of the total revenue of state if they developed.

6-What is the reason for the lack of fish in the diets of most Libyan citizens?

Libyan society not a nautical society; it relies on herding and agriculture more than anything else, except for some two or three cities. This is a reflection of its cultural history. But the diet needs to include a range of elements, especially protein, vitamin and salts and all these things; and now there is a raised [dietary] consciousness.

7- Would you like to add any information related to the subject?

No, thanks.

Thank you very much for giving us your time.

Sample of an Interview Schedule with Economic Expert in Fisheries sector in the Government

English Version of the Government-related Interview

Q1 - Statistics and information point to weakness in the marine sector's contribution to the GDP, despite the length of the Libyan coastline. In your opinion, what are the main reasons for this?

Q2- What are the things that prevent the fish market of Libya from competing with the markets of neighbouring countries as well as in the global market?

Q3- In your experience, what are the steps that the new government needs to take for this sector to be effective and to contribute to the Libyan economy?

Arabic Version of the Government-related Interview

بسم الله الرحمن الرحيم

تحية طيبة

- من خلال الأرقام والبيانات العامة يلاحظ ضعف مساهمة قطاع الثروة البحرية في الناتج المحلي الإجمالي رغم طول الساحل الليبي ، في رأيك ما هي الأسباب الرئيسية في ذلك ؟

-ما هي الأشياء التي يفتقر إليها سوق الأسماك الليبية ليكون منافسا لأسواق الدول المجاورة وكذلك السوق العالمية؟

- من خلال خبرتكم ، ما هي الخطوات التي يجب أن تتأخذها الحكومة الجديدة ليصبح هذا القطاع فعالا وداعما للأقتصاد الليبي؟

شاكرة حسن تعاونكم مسبقا .. ولكم فائق التقدير والاحترام

والسلام عليكم ورحمة الله وبركاته

Peace, mercy and blessings of Allah

I will try to give you the information that you will find it useful to your research and it will answer your questions.

With about 2000 km of coastline, Libya is rather well endowed with marine fish resources. Most of the resources are moderately exploited and it is believed that there would be room for further development particularly for coastal artisanal fisheries and deep water fishery, especially as Libya has recently extended its fishing area to 60 miles beyond its territorial waters. The fisheries sector is disorganized for historical and cultural reasons. The fisheries sector is currently characterized by a weak framework for fisheries management (e.g. poor data collection, lack of scientific knowledge on marine environment and fish stocks, poor application of management measures) which affects the sustainability of resources. Other critical issues include the lack of integration of the sector into the [wider] economy, in terms of employment, food supply and income generation. Therefore, the sound planning and management of fisheries has been hampered by major information constraints: the absence of a regular data collection system on catch and effort, the absence of a reliable fishery monitoring system and inappropriate scientific knowledge on the status of the stocks, as well as the status of the specific fisheries and markets, weak coastguard control of foreign fishing vessels that fish in Libyan waters etc.

Libya has recently engaged in a process of restricting the fishing with a view to promote sustainability of the marine resource base and to increase the contribution of the sector to the national and coastal economies. Priority has been given to infrastructure development, capacity building of the key fisheries institutions (private and public), and provision of a sound policy and planning framework so as to create an enabling environment for sustainable development and management of the sector.

The economy of Libya is dominated by the oil sector. In this context, the agriculture and fisheries sectors' contribution to the overall economy of the country has remained relatively weak during recent decades i.e. inferior to less than five per cent in terms of GDP contribution.

Yet the significant marine resources are believed to be capable of generating substantial social and economic returns, provided that the fishery sector well managed.

Most catches are sold in large urban market areas and consumed fresh. A part of the small pelagic landing is processed in fish canning factories and a significant part of high value fresh fish is exported to Tunisia due to the absence of sanitary faculties and any export agreement to export direct to Europe and the international market, which results in a loss of added value for the economy. Annual fish consumption is about 7 kg per capita. Although the government established many ice plants, a lack of control was a problem; the negligence of the government hindered many projects. For example, the coastal city of Tobruk has a public company for marine products which was owned by the state and it has four ice factories, none of which are working. On the other hand, the two privately, citizen-owned ice factories are working.

During the last decade, Libya has pursued a policy oriented towards food self-sufficiency with increased investments (fleet size and infrastructure) and employment in the fishery sector. To work to this end the sector has been substantially subsidized through open access loan facilities to fisheries for boat- building and the absence of user charges for infrastructure use.

The fisheries legislation (Law 14 of 1989) is considered by many as obsolete. There is a strong need for updating or enacting new laws, so as to support the future fishery policy and to integrate major international developments into fisheries management.

A lack of knowledge about environmental matters regarding the coastal ecosystem adds to the weakness of present fisheries. There is also a lack of hygiene around most fishing sites (e.g waste dumps) and this is an environmental problem.

During the last 15 years, the sector has been characterised by high institutional instability which delayed the implementation of most developments plans.

I hope this information answers your questions

Best Regards

Sample of an Interview Schedule with a Government Official of Libya in the FAO

English Version

Q1- From your point of view is there a problem in the production of fish in the eastern region? If the answer is yes, what are the reasons that you find an obstacle to increase fish production?

Q2 Do you think that the fishing fleet located in Libya needs to be increased in terms of numbers?

Q3 Regarding the data gathered in the study carried out by the Food and Agriculture Organization? How do you assess fish stocks in Libya and the degree of pollution along the Libyan coast?

Q4 In your experience, what are the ways for the advancement of the fisheries sector in order for it to be effective in contributing to the national economy and food security?

Q5 Do you think that there is a possibility for the establishment of a supportive and complementary industries in this respect, and what, in your view, are the basic requirements for these?

Arabic Version

بسم الله الرحمن الرحيم والصلاة والسلام على أشرف الأنبياء

والمرسلين سيدنا محمد وعلى الله وصحبه أجمعين

تحيه طيبه

س1 من وجه نظر سيادتكم هل توجد مشكلة في إنتاج الأسماك في المنطقة الشرقية في ليبيا ؟ وإذا كانت الإجابة بنعم ، ما هي الأسباب التي تجدها تقف عائقا لزيادة إنتاج الأسماك في ليبيا؟

س2 هل تعتقد إن أسطول الصيد الموجود في ليبيا يحتاج إلى زيادة من حيث العدد ؟

س3 بخصوص البيانات ومن خلال المعلومات ونتائج الدراسة التي تقوم بها منظمة الأغذية والزراعة ، كيف تقيمون المخزون السمكي في ليبيا ودرجة التلوث في الشاطئ الليبي؟

س4 من خلال خبرتكم ما هي أفضل الطرق للنهوض بقطاع الثروة السمكية لكي يكون فعالا في الأقتصاد الوطني ومساهما في الأمن الغذائي في ليبيا ؟

س5 هل تعتقد إن هناك إمكانية لقيام صناعات تكميلية وداعمة في هذا الجانب، وما هي المتطلبات الأساسية لقيامها من وجهة نظر سيادتكم؟

شكرا مقدما على تعاونكم

Sample of an Interview Schedule with a Government Official of Libya in the FAO

Q1- From your point of view is there a problem in the production of fish in the eastern region? If the answer is yes, what are the reasons that you find an obstacle to increase fish production?

From my point of view, one of the things that stands in the way of as a barrier against the increasing of fish production is the lack of national employment in the fisheries sector in Libya ; it relies primarily which depends mainly on foreign labour. I will summarize the main reasons which are considered to be the major obstacles facing the fish production in Libya in general including the east coast:

1- Lack of fishing skills and the lack of a national work-force; the sector which depends mainly on migrant labour.

2- Landing zones are ill-equipped and disorganized and thus unable to receive the quantities of fish being caught in a healthy manner, and the unavailability of appropriate fishing gear

3- Lack of suitable ports along the Libyan coast.

4- Lack of workshops, parts and human potential required for maintenance.

5- The continuing use of traditional fishing methods., and a failure to deploy technology in fishing.

6- Lack of good harbours along the Libyan coast and on the landing zones in Libya constitutes a problem; the facilities are not properly equipped and they are disorganized.

7- No adequate marketing channels locally and abroad hence cannot be exported fish to the European market due to the latter's special conditions of European market.

8- Laws and regulations governing the fishing process is appropriate and they need to be developed.

Q2 Do you think that the fishing fleet located in Libya needs to be increased in terms of numbers?

- No, the Libyan size of the fleet is sufficient , but it may not be equal in the regions. For example, a study of the eastern region really needed to provide up-to- data.

Q3 Regarding the data gathered in the study carried out by the Food and Agriculture Organization? How do you assess fish stocks in Libya and the degree of pollution along the Libyan coast?

Since 1996, there have been no studies to assess fish stocks. Scientific studies should be carried out to determine fish stocks so that a plan can be to developed a plan commensurate with the scientific results of the study for the purpose of proper and sustainable investment. There is pollution especially in the coastal towns due to untreated sewage which pours directly into the sea causing bacterial pollution. The results of the studies carried out by the Centre of Marine Biology also document the presence of oil pollution along the Libyan coast beaches on both sandy and rocky types of beaches because of the ballast water from oil ships. Scientific studies related to fish stock and pollution will contribute to the advancement of the fisheries sector, which will be effective in its contribution to food security in Libya.

Q4 In your experience, what are the ways for the advancement of the fisheries sector in order for it to be effective in contributing to the national economy and food security?

There is a lot that must be done in order to promote the development of this sector. Initially, g an appropriate infrastructure must create the for the fishing industry commensurate with the length of the coastline as well as the Libyan fishing fleet , and this must be accompanied with doing by scientific studies related to the status of fish stocks and the marine environment, modern fishing techniques modern and pollution. And do not forget that the laws and regulations play a very important role therefore, investment law should be amended to support investment and finance.

The fishermen also need to educate consumers and media programmes need to be used studied for the purpose of preserving the marine environment and optimizing the methods of investment optimization.

Q5 Do you think that there is a possibility for the establishment of a supportive and complementary industries in this respect, and what, in your view, are the basic requirements for these?

There is potential to establish complementary industries, however, there are many things have to be put in place for these to operate effectively: ice plants, handling equipment, and factories for fish canning, fish preservation, fishmeal, fish oils, and plants for other products such as fish fillets and canned seafood. This also requires support for financial investment, the amendment of some investment legislation, the opening of internal and external marketing channels and awareness campaigns directed at the consumer and the producer. The government should modify some of the investment laws so that they support, reinforce and enable the establishment of complementary industries related to fish products.

If the industry is to prosper in the future, it requires financial support for investment, amendment of some investment laws, the opening of channels of internal and external marketing and awareness campaigns directed at the consumer and the producer.

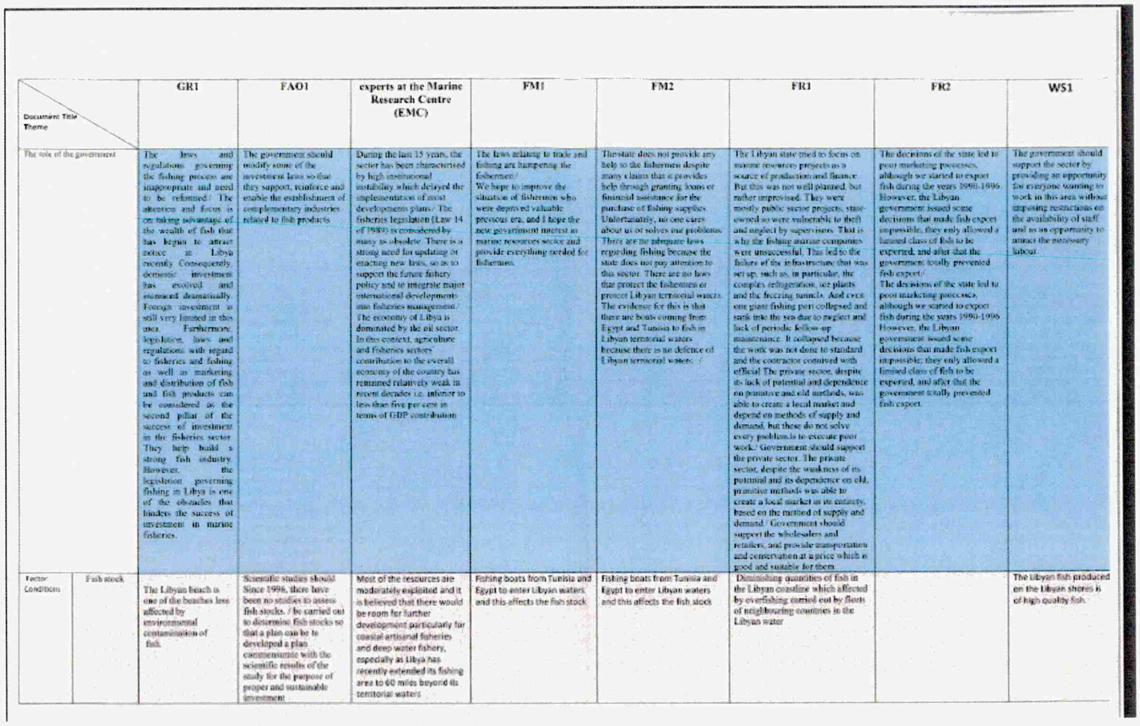
Do you have anything to add?

Yes, we must fight against illegal fishing methods such as explosives, toxic chemicals, and we must also support specialized research centres in terms of training technical personnel, and do the researches necessary to develop the sector as a whole.

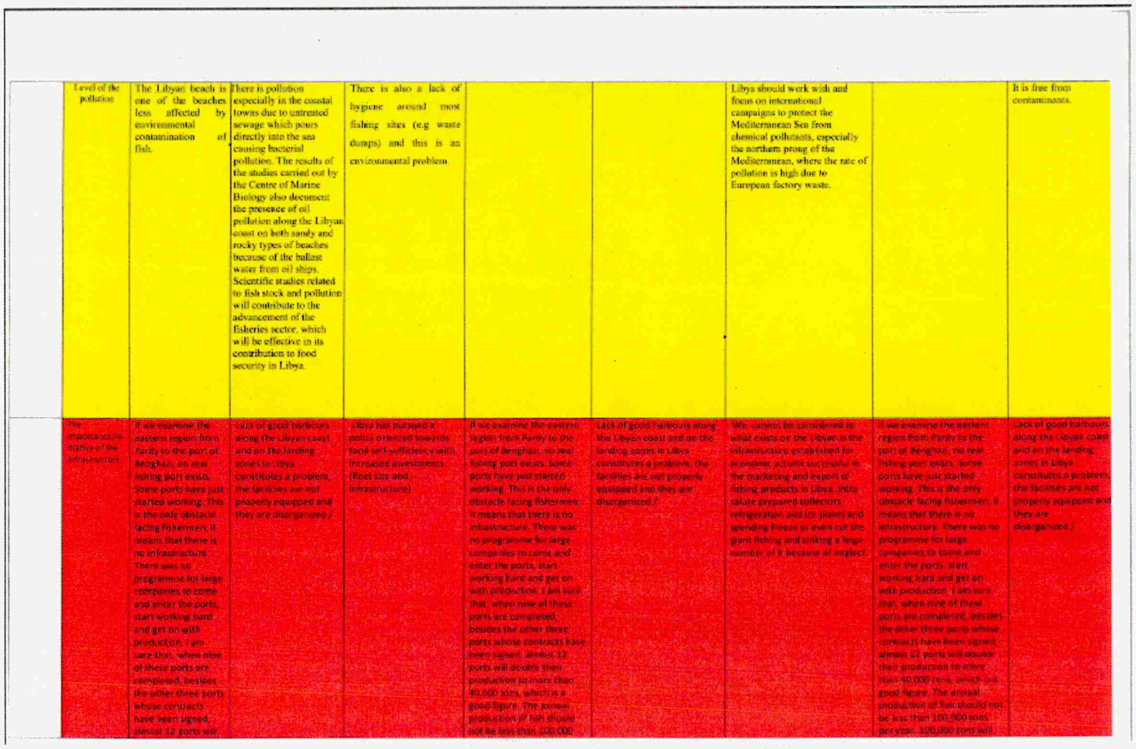
Best Regards

Appendix H (2)

Shows example: organize of the raw data from the interviews according to the themes 'Determinants of diamond model')



Document Title Theme		GR1	FAO1	experts at the Marine Research Centre (EMC)	FM1	FM2	FR1	FR2	WS1
The role of the government		The laws and regulations governing the fishing process are inappropriate and need to be reformed/ The attention and focus is on taking advantage of the wealth of fish that has begun to attract notice in Libya recently. Consequently, domestic investment has evolved and increased dramatically. Foreign investment is still very limited in this area. Furthermore, legislation, laws and regulations with regard to fisheries and fishing as well as marketing and distribution of fish and fish products can be considered as the second pillar of the success of investment in the fisheries sector. They help build a strong fish industry. However, the legislation governing fishing in Libya is one of the obstacles that hinders the success of investment in marine fisheries.	The government should modify some of the investment laws so that they support, reinforce and enable the establishment of complementary industries related to fish products	During the last 15 years, the sector has been characterised by high institutional instability which delayed the implementation of most developments plans/ The fisheries legislation (Law 14 of 1989) is considered by many as obsolete. There is a strong need for updating or enacting new laws, so as to support the future fishery policy and to integrate major international developments into fisheries management/ The economy of Libya is dominated by the oil sector. In this context, agriculture and fisheries sectors' contribution to the overall economy of the country has remained relatively weak in recent decades i.e. inferior to less than five per cent in terms of GDP contribution	The laws relating to trade and fishing are hampering the fishermen/ We hope to improve the situation of fishermen who were deprived valuable previous era, and I hope the new government interest in marine resources sector and provide everything needed for fishermen.	The state does not provide any help to the fishermen despite many claims that it provides help through granting loans or financial assistance for the purchase of fishing supplies. Unfortunately, no one cares about us or solves our problems. There are no adequate laws regarding fishing because the state does not pay attention to this sector. There are no laws that protect the fishermen or protect Libyan territorial waters. The evidence for this is that there are boats coming from Egypt and Tunisia to fish in Libyan territorial waters because there is no defence of Libyan territorial waters. /	The Libyan state tried to focus on marine resources projects as a source of production and finance. But this was not well planned, but rather improvised. They were mostly public sector projects, state-owned so were vulnerable to theft and neglect by supervisors. That is why the fishing marine companies were unsuccessful. This led to the failure of the infrastructure that was set up, such as, in particular, the complex refrigeration, ice plants and the freezing tunnels. And even one giant fishing port collapsed and sank into the sea due to neglect and lack of periodic follow-up maintenance. It collapsed because the work was not done to standard and the contractor connived with official The private sector, despite its lack of potential and dependence on primitive and old methods, was able to create a local market and depend on methods of supply and demand, but these do not solve every problem is to execute poor work./ Government should support the private sector. The private sector, despite the weakness of its potential and its dependence on old, primitive methods was able to create a local market in its entirety, based on the method of supply and demand./ Government should support the wholesalers and retailers, and provide transportation and conservation at a price which is good and suitable for them	The decisions of the state led to poor marketing processes, although we started to export fish during the years 1990-1996. However, the Libyan government issued some decisions that made fish export impossible; they only allowed a limited class of fish to be exported, and after that the government totally prevented fish export./ The decisions of the state led to poor marketing processes, although we started to export fish during the years 1990-1996. However, the Libyan government issued some decisions that made fish export impossible; they only allowed a limited class of fish to be exported, and after that the government totally prevented fish export.	The government should support the sector by providing an opportunity for everyone wanting to work in this area without imposing restrictions on the availability of staff and as an opportunity to attract the necessary labour.
Factor Conditions	Fish stock	The Libyan beach is one of the beaches less affected by environmental contamination of fish.	Scientific studies should Since 1996, there have been no studies to assess fish stocks. / be carried out to determine fish stocks so that a plan can be to developed a plan commensurate with the scientific results of the study for the purpose of proper and sustainable investment	Most of the resources are moderately exploited and it is believed that there would be room for further development particularly for coastal artisanal fisheries and deep water fishery, especially as Libya has recently extended its fishing area to 60 miles beyond its territorial waters	Fishing boats from Tunisia and Egypt to enter Libyan waters and this affects the fish stock	Fishing boats from Tunisia and Egypt to enter Libyan waters and this affects the fish stock	Diminishing quantities of fish in the Libyan coastline which affected by overfishing carried out by fleets of neighbouring countries in the Libyan water		The Libyan fish produced on the Libyan shores is of high quality fish.



	Level of the pollution	The Libyan beach is one of the beaches less affected by environmental contamination of fish.	There is pollution especially in the coastal towns due to untreated sewage which pours directly into the sea causing bacterial pollution. The results of the studies carried out by the Centre of Marine Biology also document the presence of oil pollution along the Libyan coast on both sandy and rocky types of beaches because of the ballast water from oil ships. Scientific studies related to fish stock and pollution will contribute to the advancement of the fisheries sector, which will be effective in its contribution to food security in Libya.	There is also a lack of hygiene around most fishing sites (e.g waste dumps) and this is an environmental problem.			Libya should work with and focus on international campaigns to protect the Mediterranean Sea from chemical pollutants, especially the northern prong of the Mediterranean, where the rate of pollution is high due to European factory waste.		It is free from contaminants.
	The [illegible] status of the infrastructure	If we examine the eastern region from Fardy to the port of Benghazi, no real fishing port exists. Some ports have just started working. This is the only obstacle facing fishermen. It means that there is no infrastructure. There was no programme for large companies to come and enter the ports, start working hard and get on with production. I am sure that, when nine of these ports are completed, besides the other three ports whose contracts have been signed, almost 12 ports will	Lack of good harbours along the Libyan coast and on the landing zones in Libya constitutes a problem, the facilities are not properly equipped and they are disorganized /	Libya has pursued a policy oriented towards food self-sufficiency with increased investments (fleet size and infrastructure)	If we examine the eastern region from Fardy to the port of Benghazi, no real fishing port exists. Some ports have just started working. This is the only obstacle facing fishermen. It means that there is no infrastructure. There was no programme for large companies to come and enter the ports, start working hard and get on with production. I am sure that, when nine of these ports are completed, besides the other three ports whose contracts have been signed, almost 12 ports will double their production to more than 40,000 tons, which is a good figure. The annual production of fish should not be less than 100,000	Lack of good harbours along the Libyan coast and on the landing zones in Libya constitutes a problem, the facilities are not properly equipped and they are disorganized /	We cannot be considered to what exists on the Libyan is the infrastructure established for economic activity successful in the marketing and export of fishing products in Libya. Intra salute prepared collectors refrigeration and ice plants and spending freeze or even cut the giant fishing and sinking a large number of it because of neglect	If we examine the eastern region from Fardy to the port of Benghazi, no real fishing port exists. Some ports have just started working. This is the only obstacle facing fishermen. It means that there is no infrastructure. There was no programme for large companies to come and enter the ports, start working hard and get on with production. I am sure that, when nine of these ports are completed, besides the other three ports whose contracts have been signed almost 12 ports will double their production to more than 40,000 tons, which is a good figure. The annual production of fish should not be less than 100,000 tons per year. 100,000 tons will	Lack of good harbours along the Libyan coast and on the landing zones in Libya constitutes a problem, the facilities are not properly equipped and they are disorganized /

Detail of questionnaire analysis

Appendix I

The Chi Square Results of, Type of Fishing Boat, Number of Fishermen and Experience of the Fishermen

Table 1 (a) Case Processing Summary

Type of Boat * Fish Quantity

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Type of BOAT * B_QUENTITY	111	100.0%	0	0.0%	111	100.0%

Table 1 (b) Type of Boat * Fish Quantity , eastern region Crosstabulation

Type of Boat * Fish Quantity Crosstabulation

			B_QUENTITY			Total
			.10 - 3 tons	3.01 - 6 tons	6.01 - 60 tons	
Type of BOAT	FLOUK	Count	48	14	15	77
		Expected Count	37.5	12.5	27.1	77.0
		% within Type of BOAT	62.3%	18.2%	19.5%	100.0%
		% of Total	43.2%	12.6%	13.5%	69.4%
	MATOR + JARAFAT	Count	6	4	24	34
		Expected Count	16.5	5.5	11.9	34.0
		% within Type of BOAT	17.6%	11.8%	70.6%	100.0%
		% of Total	5.4%	3.6%	21.6%	30.6%
Total		Count	54	18	39	111
		Expected Count	54.0	18.0	39.0	111.0
		% within Type of BOAT	48.6%	16.2%	35.1%	100.0%
		% of Total	48.6%	16.2%	35.1%	100.0%

Type of Boat * Fish Quantity

Table 1(c) Chi-Square Tests

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	27.816[a]	2	.000
Likelihood Ratio	28.064	2	.000
Linear-by-Linear Association	26.172	1	.000
N of Valid Cases	111		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 5.51.

Table 1(d) Symmetric Measures

Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	.501	.000
	Cramer's V	.501	.000
N of Valid Cases		111	

Number of Fishermen working on the boat * Fish Quantity

Table 2 (a) Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
v Number of Fishermen working on the boat * Fish Quantity	110	99.1%	1	0.9%	111	100.0%

Table 2 (b)Number of Fishermen working on the boat * Fish Quantity , eastern region Crosstabulation

Number of Fishermen working on the boat		Fish Quantity			Total
		.10 - 3 tons	3.01 - 6 tons	6.01 - 60 tons	
1-3 Fisherman	Count	30	5	6	41
	Expected Count	19.8	6.7	14.5	41.0
	% within Fish Quantity	56.6%	27.8%	15.4%	37.3%
4-7 Fisherman	Count	22	10	21	53
	Expected Count	25.5	8.7	18.8	53.0
	% within Fish Quantity	41.5%	55.6%	53.8%	48.2%
8-17 Fisherman	Count	1	3	12	16
	Expected Count	7.7	2.6	5.7	16.0
	% within Fish Quantity	1.9%	16.7%	30.8%	14.5%
Total	Count	53	18	39	110
	Expected Count	53.0	18.0	39.0	110.0
	% within B_QUENTITY	100.0%	100.0%	100.0%	100.0%

Table 2 (c) Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	24.666[a]	4	.000
Likelihood Ratio	27.181	4	.000
Linear-by-Linear Association	23.835	1	.000
N of Valid Cases	110		

a. 1 cells (11.1%) have expected count less than 5. The minimum expected count is 2.62.

Table 2 (d)Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	.474	.000
	Cramer's V	.335	.000
N of Valid Cases		110	

Number years of Fishermen's Experience * Fish Quantity

Table 3 (a) Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
v Number years of Fishermen's Experience * Fish Quantity	111	100.0%	0	0.0%	111	100.0%

Table 3 (b)Number years of Fishermen's Experience * Fish Quantity Crosstabulation

Number years of Fishermen's Experience		Fish Quantity			Total
		.10 - 3 tons	3.01 - 6 tons	6.01 - 60 tons	
1-10	Count	25	5	7	37
	Expected Count	18.0	6.0	13.0	37.0
	% within Fish Quantity	46.3%	27.8%	17.9%	33.3%
11-20	Count	20	8	21	49
	Expected Count	23.8	7.9	17.2	49.0
	% within Fish Quantity	37.0%	44.4%	53.8%	44.1%
21 and more	Count	9	5	11	25
	Expected Count	12.2	4.1	8.8	25.0
	% within Fish Quantity	16.7%	27.8%	28.2%	22.5%
Total	Count	54	18	39	111
	Expected Count	54.0	18.0	39.0	111.0
	% within Fish Quantity	100.0%	100.0%	100.0%	100.0%

Table 3 (c) Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	8.710[a]	4	.069
Likelihood Ratio	8.993	4	.061
Linear-by-Linear Association	6.728	1	.009
N of Valid Cases	111		

a. 1 cells (11.1%) have expected count less than 5. The minimum expected count is 4.05.

Table 3 (d)Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	.280	.069
	Cramer's V	.198	.069
N of Valid Cases		111	

Appendix J

The Statics related to the allocations of fishery sector in development plans 1988-2005

Year	Total development allocations	allocations of Marine Resources
1972	442.9	---
1973	545	0
1974	916.2	0
1975	1124.7	3.9
1976	1407.7	8.8
1977	1520	14
1978	1785	15.8
1979	1573	10.1
1980	2527.5	0
1981	3000	0
1982	2600	0
1983	2369.6	0
1984	2110	0
1985	1699.9	0
1986	1700	0
1987	1450	0
1988	1855	12
1989	900	12
1990	1170	12
1991	2035	13.1
1992	1005	10
1993	484.5	7.5
1994	890	10.6
1995	735	6
1996	785	9
1997	1008.9	13.5
1998	1073.1	13.9
1999	895	14.6
2000	1765	30.6
2001	1900	0
2002	3701.1	14.7
2003	2664.1	0
2004	5237	22.5
2005	1105	57.75

Source: National Foundation for Maritime Investment, 2005

Appendix K

Details of Findings about Factors Affecting Fish Consumption Using Chi Square Test

Age of the head of the family * Frequency of Fish Consumption

Table 1 (a) Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Age of the head of the family * Frequency of Fish Consumption	395	98.8%	5	1.3%	400	100.0%

Table 1 (b) Frequency of Fish Consumption * Age of the head of the family Crosstabulation

Frequency of Fish Consumption		Age of the head of the family: Under 25	26-45	46-60	61+	Total
never	Count	1	19	8	6	34
	Expected Count	1.5	12.7	13.0	6.8	34.0
	% within Age of the head of the family	5.9%	12.8%	5.3%	7.6%	8.6%
Once during the season (four month)	Count	7	55	37	27	126
	Expected Count	5.4	47.2	48.2	25.2	126.0
	% within Age of the head of the family	41.2%	37.2%	24.5%	34.2%	31.9%
once a month	Count	3	44	50	24	121
	Expected Count	5.2	45.3	46.3	24.2	121.0
	% within Age of the head of the family	17.6%	29.7%	33.1%	30.4%	30.6%
1-2 times per month	Count	3	17	43	13	76
	Expected Count	3.3	28.5	29.1	15.2	76.0
	% within Age of the head of the family	17.6%	11.5%	28.5%	16.5%	19.2%
3-4 time per month or more	Count	3	13	13	9	38
	Expected Count	1.6	14.2	14.5	7.6	38.0
	% within Age of the head of the family	17.6%	8.8%	8.6%	11.4%	9.6%
Total	Count	17	148	151	79	395
	Expected Count	17.0	148.0	151.0	79.0	395.0
	% within Age of the head of the family	100.0%	100.0%	100.0%	100.0%	100.0%

Table 1(c)Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	24.306[a]	12	.018
Likelihood Ratio	24.214	12	.019
Linear-by-Linear Association	2.917	1	.088
N of Valid Cases	395		

a. 3 cells (15.0%) have expected count less than 5. The minimum expected count is 1.46.

Table 1 (d)Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	.248	.018
	Cramer's V	.143	.018
N of Valid Cases		395	

Family Size * Frequency of Fish Consumption

Table 2 (a)Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Family Size * Frequency of Fish Consumption	395	98.8%	5	1.3%	400	100.0%

Table 2 (b) Family Size * Frequency of Fish Consumption _ Crosstabulation

Frequency of Fish Consumption		Family Size				Total
		1-4 persons	5-6 persons	7-8 persons	over 8	
never	Count	5	4	13	12	34
	Expected Count	6.8	6.5	10.8	10.0	34.0
	% within Family Size	6.3%	5.3%	10.4%	10.3%	8.6%
Once during the season (four month)	Count	25	22	51	28	126
	Expected Count	25.2	23.9	39.9	37.0	126.0
	% within Family Size	31.6%	29.3%	40.8%	24.1%	31.9%
once a month	Count	17	17	38	49	121
	Expected Count	24.2	23.0	38.3	35.5	121.0
	% within Family Size	21.5%	22.7%	30.4%	42.2%	30.6%
1-2 times per month	Count	19	20	14	23	76
	Expected Count	15.2	14.4	24.1	22.3	76.0
	% within Family Size	24.1%	26.7%	11.2%	19.8%	19.2%
3-4 time per month or more	Count	13	12	9	4	38
	Expected Count	7.6	7.2	12.0	11.2	38.0
	% within Family Size	16.5%	16.0%	7.2%	3.4%	9.6%
Total	Count	79	75	125	116	395
	Expected Count	79.0	75.0	125.0	116.0	395.0
	% within Family Size	100.0%	100.0%	100.0%	100.0%	100.0%

Table2(c)Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	36.221[a]	12	.000
Likelihood Ratio	37.003	12	.000
Linear-by-Linear Association	7.814	1	.005
N of Valid Cases	395		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 6.46.

Table 2 (d)Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	.303	.000
	Cramer's V	.175	.000
N of Valid Cases		395	

Family Income &Frequency of Fish Consumption

Table3 (a)Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Frequency of Fish Consumption * Family income	395	98.8%	5	1.3%	400	100.0%

Table 3 (b) Frequency of Fish Consumption * Family income _Crosstabulation

Frequency of Fish Consumption		Family income			Total
		600 D or less	601-900 D	901 or more D	
never	Count	20	10	4	34
	Expected Count	16.6	9.7	7.7	34.0
	% within Family income	10.4%	8.8%	4.5%	8.6%
Once during the season (four month)	Count	89	22	15	126
	Expected Count	61.6	36.0	28.4	126.0
	% within Family income	46.1%	19.5%	16.9%	31.9%
once a month	Count	50	43	28	121
	Expected Count	59.1	34.6	27.3	121.0
	% within Family income	25.9%	38.1%	31.5%	30.6%
1-2 times per month	Count	25	27	24	76
	Expected Count	37.1	21.7	17.1	76.0
	% within Family income	13.0%	23.9%	27.0%	19.2%
3-4 time per month or more	Count	9	11	18	38
	Expected Count	18.6	10.9	8.6	38.0
	% within Family income	4.7%	9.7%	20.2%	9.6%
Total	Count	193	113	89	395
	Expected Count	193.0	113.0	89.0	395.0
	% within Family income	100.0%	100.0%	100.0%	100.0%

Table 3 (c)Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	53.253[a]	8	.000
Likelihood Ratio	52.997	8	.000
Linear-by-Linear Association	39.937	1	.000
N of Valid Cases	395		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 7.66.

Table 3 (d)Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	.367	.000
	Cramer's V	.260	.000
N of Valid Cases		395	

Frequency of Fish Consumption * Citie

Table 4 (a)Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Frequency of Fish Consumption * the City	395	98.8%	5	1.3%	400	100.0%

Table 4 (b) Frequency of Fish Consumption * Name of the City Crosstabulation

Frequency of Fish Consumption		Name of the City				Total
		Benghaze	Albeide	Shahat	Tobruk	
never	Count	26	3	2	3	34
	Expected Count	23.7	5.2	1.4	3.8	34.0
	% within Name of the City	9.5%	5.0%	12.5%	6.8%	8.6%
Once during the season (four month)	Count	97	22	3	4	126
	Expected Count	87.7	19.1	5.1	14.0	126.0
	% within Name of the City	35.3%	36.7%	18.8%	9.1%	31.9%
once a month	Count	86	19	6	10	121
	Expected Count	84.2	18.4	4.9	13.5	121.0
	% within Name of the City	31.3%	31.7%	37.5%	22.7%	30.6%
1-2 times per month	Count	47	12	4	13	76
	Expected Count	52.9	11.5	3.1	8.5	76.0
	% within Name of the City	17.1%	20.0%	25.0%	29.5%	19.2%
3-4 time per month or more	Count	19	4	1	14	38
	Expected Count	26.5	5.8	1.5	4.2	38.0
	% within Name of the City	6.9%	6.7%	6.3%	31.8%	9.6%
Total	Count	275	60	16	44	395
	Expected Count	275.0	60.0	16.0	44.0	395.0
	% within Name of the City	100.0%	100.0%	100.0%	100.0%	100.0%

Table 4 (C)Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	40.989[a]	12	.000
Likelihood Ratio	35.549	12	.000
Linear-by-Linear Association	23.561	1	.000

N of Valid Cases	395		

a. 6 cells (30.0%) have expected count less than 5. The minimum expected count is 1.38.

Table 4 (d)Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	.322	.000
	Cramer's V	.186	.000
N of Valid Cases		395	

Frequency of Fish Consumption * Convenience (preparing fish meal)

Table 5(a)Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Frequency of Fish Consumption * Convenience (preparing fish meal)	387	96.8%	13	3.3%	400	100.0%

Table 5 (b) Frequency of Fish Consumption * Convenience (preparing fish meal) Crosstabulation

Frequency of Fish Consumption		Convenience (preparing fish meal)		Total
		yes	No	
never	Count	17	16	33
	Expected Count	13.6	19.4	33.0
	% within Prepare of Fish meals	10.7%	7.0%	8.5%
Once during the season (four month)	Count	38	86	124
	Expected Count	50.9	73.1	124.0
	% within Prepare of Fish meals	23.9%	37.7%	32.0%
once a month	Count	40	80	120
	Expected Count	49.3	70.7	120.0
	% within Prepare of Fish meals	25.2%	35.1%	31.0%
1-2 times per month	Count	44	31	75
	Expected Count	30.8	44.2	75.0
	% within Prepare of Fish meals	27.7%	13.6%	19.4%
3-4 time per month or more	Count	20	15	35
	Expected Count	14.4	20.6	35.0
	% within Prepare of Fish meals	12.6%	6.6%	9.0%
Total	Count	159	228	387
	Expected Count	159.0	228.0	387.0
	% within Prepare of Fish meals	100.0%	100.0%	100.0%

Table 5 (c) Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	23.352[a]	4	.000
Likelihood Ratio	23.310	4	.000
Linear-by-Linear Association	8.224	1	.004
N of Valid Cases	387		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 13.56.

Table 5 (d) Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	.246	.000
	Cramer's V	.246	.000
N of Valid Cases		387	

Frequency of Fish Consumption * Health- Related beliefs

Table 6(a)Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Frequency of Fish Consumption * Health-Related beliefs	395	98.8%	5	1.3%	400	100.0%

Table 6(b) Frequency of Fish Consumption * Health- Related beliefs Crosstabulation

Frequency of Fish Consumption		Health- Related beliefs		Total
		yes	no	
never	Count	22	12	34
	Expected Count	27.6	6.4	34.0
	% within Health- Related beliefs	6.9%	16.2%	8.6%
Once during the season (four month)	Count	97	29	126
	Expected Count	102.4	23.6	126.0
	% within Health- Related beliefs	30.2%	39.2%	31.9%
once a month	Count	109	12	121
	Expected Count	98.3	22.7	121.0
	% within Health- Related beliefs	34.0%	16.2%	30.6%
1-2 times per month	Count	60	16	76
	Expected Count	61.8	14.2	76.0
	% within Health- Related beliefs	18.7%	21.6%	19.2%
3-4 time per month or more	Count	33	5	38
	Expected Count	30.9	7.1	38.0
	% within Health- Related beliefs	10.3%	6.8%	9.6%
Total	Count	321	74	395
	Expected Count	321.0	74.0	395.0
	% within Health- Related beliefs	100.0%	100.0%	100.0%

Table 6(c) Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	14.864[a]	4	.005
Likelihood Ratio	14.908	4	.005
Linear-by-Linear Association	4.939	1	.026
N of Valid Cases	395		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 6.37.

Table 6(d) Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	.194	.005
	Cramer's V	.194	.005
N of Valid Cases		395	

Appendix L

Binary Regression Analysis

Table 7 (a) Case Processing Summary

Unweighted Cases[a]		N	Percent
Selected Cases	Included in Analysis	387	96.8
	Missing Cases	13	3.3
	Total	400	100.0
Unselected Cases		0	.0
Total		400	100.0

a. If weight is in effect, see classification table for the total number of cases.

Table 7(c) Classification Table[a,b]

	Observed		Predicted		
			frequency of fish		Percentage Correct
			do not eat fish	eat fish	
Step 0	frequency of fish	do not eat fish	277	0	100.0
		eat fish	110	0	.0
	Overall Percentage				71.6

a. Constant is included in the model.
b. The cut value is .500

Table 7(d) Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)
Step 0 Constant	-.924	.113	67.154	1	.000	.397

Table 7(e) Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	357.954[a]	.236	.338

a. Estimation terminated at iteration number 5 because parameter estimates changed by less than .001.

Table 6 (f) Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B)	
							Lower	Upper
agex1			12.868	3	.005			
age (1)	.142	.639	.049	1	.824	1.153	.329	4.036
age (2)	-1.143	.327	12.191	1	.000	.319	.168	.606
age (3)	-.358	.362	.980	1	.322	.699	.344	1.421
Family Size			16.109	3	.001			
Family Size (1)	.990	.386	6.567	1	.010	2.691	1.262	5.736
Family Size (2)	1.270	.388	10.696	1	.001	3.561	1.664	7.623
Family Size (3)	.084	.373	.051	1	.821	1.088	.523	2.262
income_7			25.422	2	.000			
income_7(1)	.746	.320	5.423	1	.020	2.109	1.125	3.953
income_7(2)	1.665	.330	25.403	1	.000	5.285	2.766	10.097
City			27.885	3	.000			
City(1)	.128	.387	.109	1	.741	1.136	.532	2.427
City(2)	.699	.688	1.034	1	.309	2.013	.523	7.748
City(3)	2.253	.432	27.227	1	.000	9.514	4.082	22.175
Convenience (preparing fish meal) (1)	1.065	.267	15.908	1	.000	2.900	1.719	4.893
Health- Related beliefs (1)	-.305	.334	.833	1	.361	.737	.383	1.418
Constant	-2.268	.447	25.712	1	.000	.104		

a. Variable(s) entered on step 1: agex1, famsize_R, income_7, City, easyperper, healthy.