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Conceptual Framework for the Sustainable Benefit Evaluation of UK Social Housing Projects

Anthony Paul Higham

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Abstract

Recent decades have seen an expansion in the role and size of the UK social housing sector. This sector is challenged to use its new housing development, regeneration and improvement programmes to deliver social benefit within an environment affected by government policies on funding and in the organisational context of particular geographical and commercial pressures. Such challenges draw focus to the under-researched field of asset management. Traditionally, this field has been dominated by the financial measures of success rather than the wider benefits to the community. However, this study proposes a new approach that is grounded in the theory of sustainability, within which investments are appraised not only on their financial merits but also on their interplay with the human environment within which they are located through the assessment of social and local economic benefits.

Initially implementing a qualitative methodology, the research explores the existing attempts to integrate the appraisal of sustainable benefits within the decision making process. The results suggest that, to date, no apparent tool exists to facilitate this process. A further quantitative survey of UK social housing professionals was undertaken to confirm the initial observations. The results show that, despite the fact that social housing practitioners understand the importance of considering sustainability, they are not yet in a position routinely to appraise the benefits associated with potential schemes, confirming the need for the development of a sustainable benefit evaluation framework. Adopting a case study approach, this study identifies the essential features of sustainability which will ensure that such undertakings generate community benefits. These features are subsequently used to develop and validate a framework for sustainable benefit evaluation within the social housing sector, linking financial appraisal with the evaluation of sustainability. This framework provides a decision aid or tool for practitioners to employ during the early stages of appraising potential social housing investment schemes.

Acknowledgements

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Contents

List of Publications based on this Thesis

In addition to my main thesis, my ongoing research has been published at the annual ARCOM conference, to gather important feedback and ensure the academic validity of the work:

- Higham, A and Fortune, C (2012) Investment Appraisal Tools and Sustainability Evaluation in Social Housing. *In:* Smith, S.D. (Ed.), *Procs 28th Annual ARCOM Conference*, 3-5 September 2012, Edinburgh, UK. Association of Researchers in Construction Management, 1269-1278

- Higham, A and Fortune, C (2011) Sustainable Asset Management (SAM) Decision Making: An exploration of Current Practice. *In:* Egbu, C and Lou E.C.W. (Eds.), *27th Annual ARCOM Conference*, 5-7 September 2011, Bristol, UK. Association of Researchers in Construction Management, Vol. 2, 1175-1184.

- Higham, A and Fortune, C (2010) The early stage benefit planning of housing regeneration projects: the gap between theory and practice. *In:* Egbu, C (Ed.), *26th Annual ARCOM Conference*, Leeds. Association of Researchers in Construction Management, Vol. 2, 1427-36.

In addition to the above, a further conference paper has been submitted to the annual ARCOM conference 2014, and the researcher has also recently submitted a paper to a high-ranking international journal for review, as follows:

- Higham, A and Fortune, C. Sustainability and Investment Appraisal for Housing Regeneration Projects. *Journal of Engineering, Construction and Architectural Management.* In Review – Submitted February 2014.

- Higham, A and Stephenson, P (2014) Identifying Project Success Criteria for Housing Refurbishment Schemes. Submitted to 30th Annual ARCOM Conference. In Review. Abstract accepted (March 2014) – Main paper submitted April 2014

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Chapter 1   Introduction

1.1   Background

Sustainable development evolved from the numerous environmental movements in earlier decades, eventually growing into a wider discourse in the 1980s when sustainability became an accepted method of balancing environmental resource protection, social progress, social justice, economic growth and importantly stability both for now and for the future (Hill and Bowen, 1987; Hillegas, 2010). Although a myriad of definitions have been proposed which encompass these ideals, the most widely used and accepted international definition of sustainable development is that provided by Brundtland (WCED, 1987:8):

> *'Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.*

While this statement is the most widely accepted definition of sustainability, it is not without its critics (Sneddon *et al,* 2005; Djalali & Vollaard, 2008), who attest that its lack of precision leads to confusion regarding its meaning, and to people viewing it as too difficult to achieve in practice. For instance, economists tend to disagree with the commission's views about the interrelationship between the natural environment and economic and social performance, preferring to view human and natural capital as alternatives to each other rather than complements (Becker, 1997). This major difference in focus has given rise to two very different conceptual views of sustainability: in the first, *hard or strong sustainability* is more closely aligned to the World Commission on Environment and Development's (WCED) view, in that sustainability is viewed from a position whereby the ecosphere is sovereign. Natural resources can be used, as the commission suggests, in balance with other commodities, and can be depleted, but not at the expense of the planet; whereas *Soft or Weak sustainability* is more closely aligned with the economists' view, in that human capital can be used as a substitute for natural capital, which can be depleted, though critics argue that this lack of clarity has curtailed the argument against both the existence and importance of sustainability (Djalali and Vollaard, 2008).

In an attempt to refine this definition, in the second edition of their seminal text on sustainable development, Brandon and Lombardi (2011:25) offer an alternative view, suggesting that sustainable development is a:

> "... process, which aims to provide a physical, social and psychological environment in which the behaviour of human beings is harmoniously adjusted to address the integration with, and dependence upon, nature in order to improve, and not to impact adversely, upon present or future generations".

In the UK, the international commitment to sustainable development has resulted in various policy pronouncements, which have successively affected the construction sector. The UK's first sustainable development strategy, published in 1994, exhibited a rather blinkered view of sustainable development that failed to acknowledge the importance of social progress. Instead, the 1994 strategy asserted that sustainable development was achievable through the interplay of economic development and environmental protection. Subsequent revisions of the strategy followed, including 'A better quality of life – a strategy for sustainable development for the United Kingdom' (1999), and 'Securing the future' (DEFRA, 2005). Both later reports responded to the evolving interpretations of sustainable development together with the increasing focus on carbon reduction.

Allied to the essential definition of sustainable development is the diverse range of toolkits, definitions, conceptualisations and frameworks in the literature, which have attempted to aid our ability to implement this phenomenon. The recently completed Sue-MOT study, involving collaboration between several universities, suggests that some 600 frameworks exist which seek to measure sustainable development performance (Sue-Mot, n.d.). Poston *et al* (2010) recently attempted to chart the development of these frameworks as part of mapping the state of the art, defining them as either *green building rating systems*, such as BREEAM and LEED, or *sustainable assessment models*, which cover the vast range of holistic tools. Yet, whilst the vast array of developed approaches to the appraisal of sustainability attempt to advocate a framework for the attainment of sustainable development, Vanegas (2003) opines that, for the most part, they provide conflicting and misleading guidance to the user. Extending this view, Brandon and Lombardi (2011) asset they are effectively unusable in practice.

The construction industry has made significant progress towards embracing sustainable development since its initial conception in the 1980s. Sjostrom and Bakens (2010) have mapped the evolutionary development of sustainable construction over this timeframe, following what they term to have been a major paradigm shift in focus that occurred shortly after the Brundtland report to the present day (table 1.1).

Timeframe	Industry's Focus
1987 – 2000	Limited natural resources especially energy together with the desire to limit the impact on the natural environment
2000 – 2009	Focused on the technical aspects of construction including, materials, building components, and construction technologies and on energy related design concepts.
2010 – Present	Growing awareness of the significance of the non-technical Softer issues within the construction arena. With these aspects of the construction process now seen as crucial.

Table 1.1: Evolution of Sustainable Construction (Sjostrom and Bakens, 2010).

Over this time horizon, sustainability has become the construction industry's most important and challenging issue (Dale, 2007). Dale further asserts that the industry now faces a multiplicity of challenges, including: the increasing public demand for sustainable products; new government initiatives and targets concerning carbon emissions; as well as statistics showing that the construction and running of buildings is the biggest contributor to carbon emissions. The pressure on the construction industry to champion sustainability is increasing.

It has become increasingly clear that construction organisations are now appreciating the importance of adding sustainability credentials to their business (Myers, 2005). Research undertaken by Upstream (2005) on behalf of the World Wildlife Federation (WWF) and Insight Investment has found that speculative house builders are increasingly embracing sustainable development, at a strategic level, which in turn triggers advancements in both the design and construction of sustainable homes at project level. Whilst the report highlights significant areas for improvement, the research nonetheless demonstrates that house builders are becoming aware of their environmental, social and economic impact and, most importantly, are beginning to improve aspects of their processes to enhance sustainability. In support of this, Myers (2005), again using companies' annual reports, identified growing support for sustainability amongst larger construction firms, though he argues that this may be more closely related to corporate appearance than a shift in philosophy, triggered by the realisation that such organizations will be judged not only on their economic

performance but also on their commitment to environmental and social aspects (or lack thereof). Yet, the weak ability of the construction industry fully to integrate sustainability into projects has been widely acknowledged over the last decade.

Wolstenholme (2009) asserts that a shift in culture is needed if the industry is to meet its obligations with regard to sustainable development. Such an opinion is fully supported by a growing body of empirical research. The work of Fortune and Cox (2005), for instance, suggests that quantity surveyors rarely appraise sustainability during the economic evaluation of projects. Adeyeye *et al* (2007) discovered that architects would only integrate sustainability into their designs if the client requested it or the legislative framework made it a requirement, whilst Dixon *et al's* (2007) survey of the Royal Institution of Chartered Surveyors membership revealed that only a limited number were actively engaged with sustainability and sustainable development.

Sustainable Social Housing

The term 'social housing' has been in common usage in the UK since the early 1990s (Maclennan, 2007), when it evolved as a more politically correct and factually accurate label from its predecessor; the stigmatised term 'council housing'. The term is primarily a statement of tenure and forms one of three main tenures in the UK which also include owner occupation and private renting. Social housing is differentiated from the other two by being seen as a cheaper option for occupiers with below market rents, subsidised by the government. Today, such tenure is increasingly seen as 'welfare' housing, for the poorest in society. While social housing providers operate bidding systems which offer prospective and existing tenants some level of choice, the resulting housing allocation is routinely driven by need. With average social housing waiting lists exceeding 5 years for those with the lowest priority, prospective tenants give little credence to the appearance or location of the property.

At the end of the 20th century, social housing faced two key problems: there was a historical lack of investment in stock and the demand from applicants could not be met. The reality was that much of the poorest housing stock, and indeed the poorest in society, had been left in the social housing sector. This phenomena was labelled *residualisation*, a term that covers both the physical housing stock and also the status of its residents (Burrows 1997, Fitzpatrick and Pawson, 2007:170)

This is paralleled with *polarisation*, the concentration of many social problems at one extreme of the social strata. Social housing is frequently stigmatised due to the appearance of the buildings, exacerbated in certain localities by the spatial concentration of single tenure stock (Fitzpatrick and Pawson, 2007). Seventy percent of social housing tenants have incomes that lie in the poorest two fifths of the overall income distribution, and the proportion of social tenant householders in paid employment fell from 47% to 32% between 1981 and 2006. Twenty seven percent of all black and minority ethnic households are social housing tenants, including around half of all Bangladeshi and 43% of black Caribbean and black African householders. The problems are compounded by the static nature of the householders and their lack of mobility (Hills, 2007). Since 2000, the introduction of the Decent Homes Standards has sought to overcome much of the historic lack of investment, but the poor design, historic neglect and concentration of poverty associated with social housing perpetuate the stigma.

The welfare discussion over the past decade has moved away from addressing poverty towards challenging social exclusion, defined as what happens when people or places suffer from a series of problems, such as unemployment, discrimination, poor skills, low incomes, poor housing, high crime, ill health and family breakdown (Social Exclusion Unit, 2006). The housing funding agencies, including the Homes and Communities Agency (HCA) in England and its predecessor, the Housing Corporation, have attempted to combat these problems by issuing a myriad of best practice and policy guidance to those involved in the delivery of social housing outlining the importance of sustainability, sustainable development and the necessity of creating sustainable communities. The latter measure is seen by policy makers as the solution to this plague of residualisation and polarisation, or *social exclusion* for the poorest in society.

From the perspective of social housing providers, faced with the challenge of complying with these policy pronouncements, the attainment of sustainability at the project level has become a key performance criterion for all new development (Wilkies, 2006). These same desires are also apparent, although less directly, in the way in which social housing providers manage the existing stock, as organisations adapt to the political pressure placed on them to eradicate socially excluded facets of their stock through a combination of physical improvement, stock rationalisation and, ultimately, reduction (Kempton, 2004; Morrison, 2013). Whilst such re-balancing would allow the sector to overcome the pressures associated with a number of socio-economic phenomena,

including economic decline, changing social needs and increasing stigmatisation, the associated commercial benefits of undertaking such interventions are also becoming increasingly explicit as organisations recognise that such schemes allow them to meet the needs of their existing and future tenants in a more comprehensive way (Albanese, 2007; Gibb and Trebeck, 2009; Mullins, 2010; Nieboer and Gruis, 2014). Such outcomes are seen as essential to survival in what is becoming an increasingly commercialised market, as successive governments progressively liberalise the sector and further empower tenants.

Consequently, social housing providers must strategically assess the way they manage their stock, looking at issues, such as tenant profiles, areas of operation and financial viability, together with the need for wider regeneration. As a result of these increased pressures, it has become imperative that the social housing investment decisions, taken as part of an overall asset management strategy, that ensure the environmental and social benefits associated with the investment, are fully balanced with the pre-determined economic restrictions, which are inevitable within any project. Yet, in spite of that fact that Bell (1981) first proposed this argument in the 1980s, making a case for investment decisions to be based on wider benefits, rather than just project cost, together with the mounting body of empirically driven sociological research evidence supporting this position, including the highly regarded and seminal work of Power (1999) which evaluated 50 social housing estates, irrefutably evidencing that, where regeneration had been attempted based on financial appraisal alone, the outcome has often been both limited and short term as the financial merits of the decision failed fully to appreciate the importance of the underlying causes of the failure, the social housing sector has yet to engage fully with this much needed shift in practice.

In an attempt to kick start this shift of focus, the National Housing Federation, the main trade body for social housing providers, commissioned Treanor and Walker (2004) to produce best practice guidance for social housing providers as part of an overall asset management approach. The guidance provided both a list of over 90 potential features and a methodology for their evaluation. In essence, the guidance attempted to reinforce the merits of appraising neighbourhood sustainability. Unfortunately, it would seem that this guidance met with little success, as this section was removed from the second edition of the publication in 2011. Further attempts to trigger shifts in practice are evidenced in the doctrinal work of Carter (2005). Developed in cooperation with housing association delivery teams, the research focused on the need to enhance the

consideration of the wider sustainability benefits derived from the procurement of new housing development.

Whilst this work evidences the start of the move towards sustainable decision processes, if the much needed shift in practice is to become a reality, further work is clearly needed to ensure that the principles of sustainable benefit evaluation are fully embedded into practice within the sector.

For this research, sustainable benefit evaluation is deemed to include the appraisal of the predominantly social and local economic phenomena affecting investment decisions within the social housing sector. Environmental criteria will be considered, albeit within the context of their social impact. The financial criteria relating to the investment decision will still be critical to it, although these will not be a focus of this study, as techniques and methodologies for their assessment are already in place.

1.2   Research Limitations

The research has been conducted during a period of significant change in government policy and consequential changes in the social housing sector. In 2009, when the research commenced, the government's flagship Housing Market Renewal (HMR) regeneration programme was underway, with the aim of creating sustainable communities, notwithstanding the clear focus on the failing housing markets in the North of England, where the predominant tenure was owner occupation and the predominant housing type the pre-1919 terrace, which was often seriously dilapidated and on the cusp of unfitness. The HMR fund moreover included provision for the revitalisation of similarly polarised aspects of the social housing stock located in the geographical pathfinder target zones. At the same time, a number of social housing providers sought to undertake similar regeneration using private finance. Again, such schemes were undertaken with the specific aim of improving aspects of the existing stock through the creation of sustainable communities.

Regrettably, the research environment changed significantly in the summer of 2010 following the May elections and the subsequent emergency budget which heralded the immediate termination of the HMR regeneration scheme together with stringent cuts in the funding available for the construction of affordable housing. The resulting impact made sourcing research participants increasingly difficult, leading the researcher to adopt a single organisation focus, a change which proved beneficial, given Albanese's

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(2007) assertion that asset management practices are widely differentiated throughout the sector.

Given these limitations, it was resolved to implement an action research methodology, with the intention of implementing the emergent framework within the organisation in 2013. Unfortunately, in autumn 2011, responding to both the changes in the market and the retirement of the Chief Executive, the organisation merged into a significantly larger 'social housing group'. The subsequent restructuring and changes to business practice resulted in the termination of the research study. Whilst the organisation confirmed that they would allow the work to continue, they scaled back their participation. As a consequence of this change in emphasis, the organisation revoked its earlier permission for the researcher to engage with tenant groups, citing commercial sensitivity and concern that this might increase tenant expectations of highly unlikely regeneration interventions. The organisation did give the researcher access to commercially gathered customer satisfaction data but, even though the researcher attempted to undertake secondary analysis of this data, the limitations of the survey design, with the predominant use of closed questions, prevented the extraction of any meaningful findings. As a result, it must be acknowledged that the lack of resident involvement has limited the validity of the variables identified, although further work is proposed in chapter 8 with a view to overcoming this limitation. Finally, again due to the changing nature of the research environment, the conceptual framework developed has not yet been tested in a social housing organisation, although independent validation via interviews has been achieved. Whilst these limitations leave scope for a future action research study, they have nonetheless affected the validation of the framework.

1.3 Aims and Objectives

The study aims to develop a decision framework for use in the development of a business case for investment programmes in the social housing sector. The framework will facilitate the evaluation of the various, social, environmental and economic factors within the proposed projects to ascertain the most appropriate intervention.

In order to fulfil this aim, the objectives of the research are:

Objective One.   Evaluate the current state of the art relating to the theory of housing investment appraisal together with the perceived importance of sustainability.

Objective Two.   Identify and appraise the extent to which the dimensions of sustainability, namely the social, economic, and environmental dimensions, influence the asset management decision.

Objective Three.   Gain an understanding of the features of sustainability that are relevant to the benefit planning of social housing asset management.

Objective Four.   Develop and validate a sustainable asset evaluation tool for use as a decision aid during the business case appraisal for proposed stock investment.

1.4 Research Design

Investigation of a phenomenon provided the initial approach to the research. The research design was an iterative process that developed as the literature review progressed. It quickly became apparent that sustainability was an extremely broad and complex concept. The importance of treating the research topic in a holistic manner, however, was evident from an early stage, as a lot of the published research reviewed for this PhD failing to address the broad definition of sustainability. Systemic or holistic approaches were being advocated yet little empirical research had emerged that demonstrated this approach. The literature review proved a vast task, as the problem unfolded into an array of individual areas for consideration. This reinforced the need for a systemic approach to the research design. The complexity of sustainability that was encountered in the literature led to consideration of systems thinking as a conceptual framework to assist in developing an understanding in the subject. Soft Systems thinking enables researchers to develop a series of models that are tested in the real world in order to identify and put into place changes that will improve a system's performance. The project appraisal system used by asset managers had been isolated from the main body of thought in the sustainability research, and systems thinking was used to integrate the project appraisal system into the global environment that is such an important aspect of sustainability.

There was a general understanding of the need to integrate sustainability into the project evaluation stage of asset management, especially in situations where proposed investment schemes would need to develop a clear sustainable benefit argument to counter the strong financial outcomes of less favourable solutions. The aim of the study was to develop a framework or decision support tool that social housing organisations could use to integrate sustainability into the asset management process to evaluate the benefits associated with the identified options, the desired result being a mechanism that can be used to strengthen the business case for investment which may be less commercially viable than other alternatives, but that presents enhanced benefit for the community. In Chapter 3, the potential research approaches are considered in more detail. It was thought that, due to the complexity of the problem, the use of more than one research method would be beneficial and arguably essential to address the multi-faceted nature of sustainability. According to Teddie and Tashakkari (2008), quantitative and qualitative approaches have both strengths and weaknesses, and can and should be combined where appropriate.

The research has unfolded into a series of phases. Each phase has been conducted within the overall conceptual framework to address the objectives in a logical manner, each phase building on the previous one.

Phase 1 Literature Review and Methodological Development

The literature review focuses on the concepts of sustainability in the built environment and asset management in the social housing sector. A general investigation of the concept of sustainability and its evolution at the global, national and local levels was undertaken. Furthermore, the key concepts and ideas relating to social housing asset management processes are established.

Phase 2 Exploratory Interviews and Confirmatory Mapping of the State of the Art

Objective 1: Evaluate the current state of the art related to the theory of housing investment appraisal together with the perceived importance of sustainability.

Objective 2: Identify and appraise the extent to which the dimensions of sustainability, namely the social, economic, and environmental dimensions, influence the asset management decision.

The second phase of the research represented the commencement of the primary data collection. Initially, a series of exploratory interviews were conducted to explore the research problem, appraise the social housing professionals' awareness of sustainability and establish the nature of the existing processes and the tools used to evaluate investment projects.

The emergent findings were then developed into a national survey of UK social housing asset management directors. This sought to confirm the initial findings in terms of tool usage whilst also seeking to gauge the importance of sustainability through the ranking of the headline features of sustainability identified in the previous academic research. The questionnaire was widely circulated using a sample derived from a commercially available database to ensure the reliability of the results. This phase included the combination of the quantitative approach for analysing the questionnaire results and the qualitative approach for conducting the interviews.

Phase 3 Identification of the Features of Sustainability and the Development of a Conceptual Framework

Objective 3: Gain an understanding of the features of sustainability that are relevant to the benefit planning of social housing asset management.

Objective 4: Develop a sustainable asset evaluation tool for use as a decision aid during business case appraisal for proposed stock investment.

The third phase of the research represents the main focus of the thesis, with the aim of identifying the key features of sustainability that are relevant to asset management projects whilst also developing a methodology for their evaluation. In a desire to overcome some of the limitations of earlier studies, together the restrictions of the research environment described earlier, it was resolved to revert to the single case study methodology instigated in Bell's seminal work. A series of interviews were held with senior professionals drawn from across the organisation to allow the researcher to develop an understanding of their specific role whilst also allowing the identification of the attributes of sustainability relevant to their aspect of the business and so, ultimately, to potential projects.

The second stage of the case study research developed an initial conceptual framework for the sustainable benefit evaluation of potential projects. Using the features of

sustainability identified in phase one, a methodology for scoring, weighting and ranking these features was developed.

Phase 4 Framework validation

To ensure the validity of the outcomes of the third phase, a series of independent experts have been consulted, drawn from six social housing organisations and a leading social housing consultancy external to the organisations' group and independent of any earlier phase of the work. All experts were consulted, using semi-structured interviews, about the potential practical application of the framework together with the suitability of the approach and the indicators used; the results are reported in chapter 7.

1.5 Thesis Structure

The thesis reports the research work over eight chapters. The chapters are organised as follows:

Chapter 1

Introducing the research topic, the chapter discusses the main issues that are of concern to sustainable asset management within the social housing sector and presents the aims and objectives of the research together with a brief overview of the research design.

Chapter 2

The review of the literature is presented in this chapter. It is divided into two principle sections. In the first section, the general concept of sustainability is explored and its relevance to both construction and the social housing sector is investigated, before the existing sustainability evaluation frameworks are introduced and evaluated. The context of the research is presented in the second section, which evaluates how asset management is applied within social housing organisations, leading to an evaluation of the issues surrounding the sustainable appraisal of potential investment projects.

Chapter 3

The methodological approaches adopted for this research are explored in this chapter. It explores the philosophical foundations of the research followed by a detailed elaboration and justification of the methods used in this research. Finally, the Soft

Systems Methodology is presented as the conceptual framework for the subsequent phases of the research.

Chapter 4

This chapter reports on the initial phase of the primary research, consisting of two discrete segments of activity. The first, an exploratory study using a qualitative approach, aims to develop both an understanding of the importance of sustainability to housing professionals and also an initial awareness of the decision processes and tools used to justify potential investment strategies. The findings from this phase of the research are then used to develop the subsequent large scale questionnaire to map the state of the art in terms of the social housing sector's perceptions of sustainability and asset management.

Chapter 5

This chapter reports on the second phase of the primary research. Seeking to establish the features of sustainability that are likely to be essential to asset management decision making, it outlines the development of a theoretical framework for sustainability together with the results of a series of interviews which refine this initial framework into the main 49 nodes of sustainability deemed relevant to individual asset management decisions.

Chapter 6

Using the indicators developed in chapter 5, this chapter develops the initial conceptual framework for evaluating the sustainable benefits likely to derive at project level from various investment strategies to aid decision makers in the development of their business case.

Chapter 7

This chapter reports the results from a series of independent expert validations of the sustainability indicators and the initial conceptual framework developed as a result of this research.

Chapter 8

The conclusions to the research are formulated. The contribution of the research to the current research landscape is explored with a reflection on the development of the framework. Finally, avenues for further work are suggested.

A map of the research `journey' is presented in Figure 1.1., showing the relationship between the research phases and the specific activities undertaken, then relating these to the individual chapters.
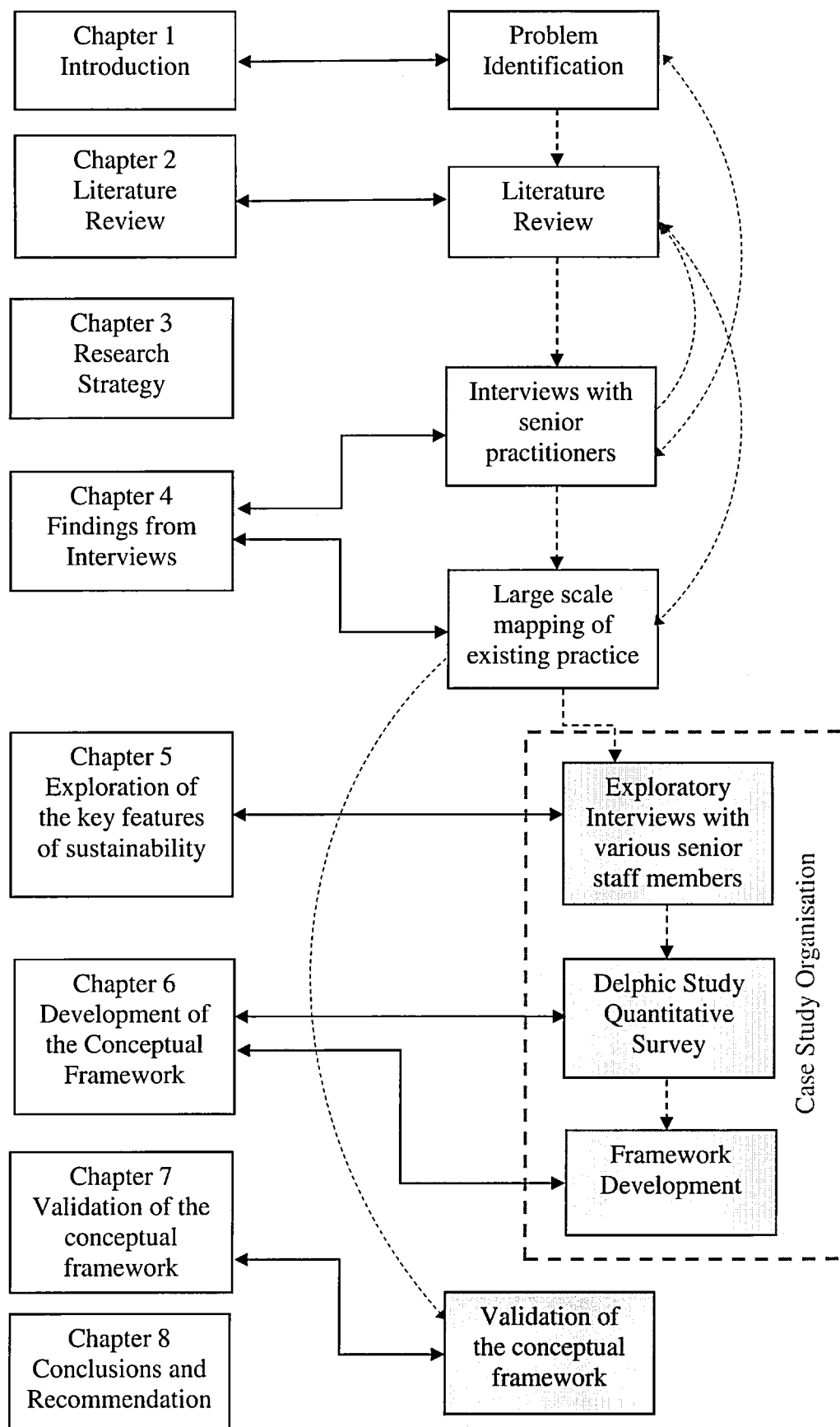
Figure 1.1: Research Process Map

Chapter 2 Literature Review

2.1 Introduction

This chapter develops the contextual background to the research conducted for the thesis. The literature spans three broad areas: (a) sustainability and sustainable development; (b) social housing asset management and, finally, (c) The frameworks and toolkits used to appraise both project sustainability and the feasibility of housing asset investment decisions (Figure 2.1). The first part of the chapter presents the development of sustainability (2.2), whilst the second part explores social housing asset management (2.3). The appraisal of the frameworks and toolkits used for both sustainability and housing asset investment decisions are presented in these two chapters (sections 2.2.7 and 2.3.4). The literature review explores the links between the background areas and reinforces the aims of the research.
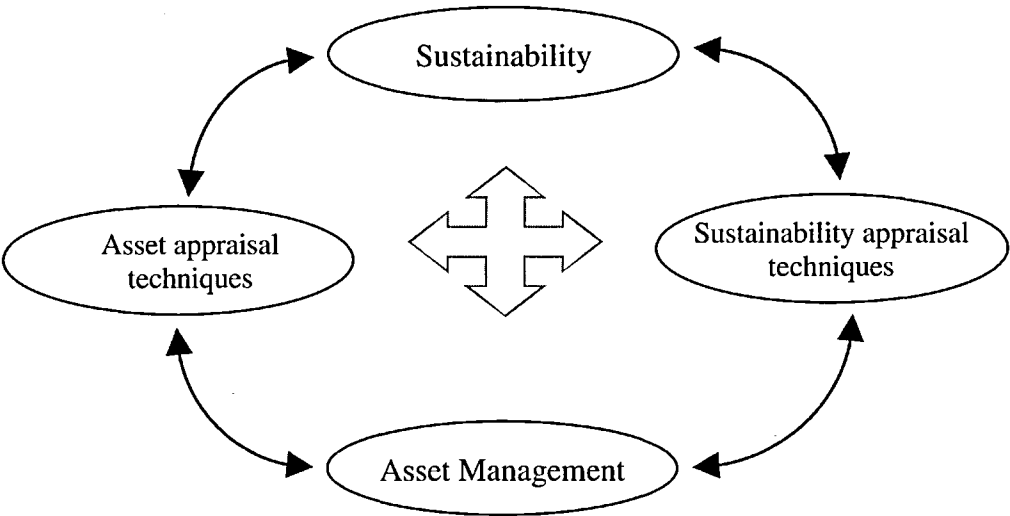
Figure 2.1: Literature Review Map

In section 2.2, the literature is reviewed to reveal the events and publications that have shaped the concept of sustainability. Sustainable development is first discussed in its global context to explore the foundations of the topic. The following section then discusses the interpretation of sustainability in the UK generally, and from the prospective of both the built environment and social policy, specifically exploring the creation of sustainable communities. The final part of the section focuses on how

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sustainable development policy is delivered at the project level and explores the ways in which the current toolkits and indicators of sustainable development are used.

This research is concerned primarily with sustainable development in the context of social housing asset management. Section 2.3 explores how formal asset management planning has become embedded in the sector, although arguably this is still in the early stages of development. The chapter explores the theoretical foundations of asset management within the sector, before reviewing the contrasts in the regional housing markets in England that have led to various responses by housing associations. The final part of the section focuses on the toolkits and frameworks used to evaluate asset management policies from a project level, specifically looking at the feasibility evaluation of potential projects.

The three strands of literature are reviewed to understand the context of sustainable development from the macro global level to the micro project implementation level. Each aspect of the literature review is intrinsically linked and the overall chapter aims to provide an overview of the complex relationships existing between sustainability and social housing asset management when evaluated from the perspective of the individual project. The chapter concludes with a summary of the literature.

2.2   Sustainable Development

The rapid advances in scientific and technological knowledge during the last century have provided humankind with the power to alter the planetary systems dramatically. This newfound power, together with the increasing population size, has led to the excessive exploitation of renewable natural resources, such as fish, wildlife and forestry (Hill and Bowen, 1997). As humankind has begun to accept, the damage that we are inflecting on the planet cannot continue at this rate. We are faced with the results of our actions as the growing scientific evidence suggests that the plant is facing a very real risk of losing the vast stocks of biological diversity it has plundered (WCED, 1987).

Throughout the 20th century a small but growing number of ecologists and scientists have questioned the ability of the planet to sustain the affluent lifestyles of the developed world. Although some argue that sustainability is a concept which was slow to evolve (Carter, 2005), its evolution is nonetheless clear, through the growth of the

environmental movement over the past few decades. Indications of transformations in the natural environment occur within the 1926 work of the prominent Russian geochemist and Mineralogist, Vladimir Ivanovich Vernadsky. Building on the work of the Austrian born geologist, Eduard Seuss, Vernadsky published 'The Biosphere', a pioneering work on environmental science. Vernadsky theorised that life on earth exists within the 'biosphere', the layers of air, water and land in which life exists or is supported (Graham, 2008). Within the biosphere, Vernadsky argued that living matter, which includes humanity, plays an important role in transforming free energy (solar energy) into the active chemical energy needed for the survival of the planet through the complex integrating activities of the living layer and the earth's geological processes (Oldfield and Shaw, 2006). However, Vernadsky contended that, in order to survive, the living matter must adapt to the physical limitations imposed by the earth's geology and chemistry. Vernadsky avowed that the processes involved with the increasingly affluent lifestyles of those living in the developed world were destabilising the natural cycles in the various layers of the biosphere, which in turn was causing increasingly damaging changes to the chemical structure of the earth (Oldfield and Shaw, 2006) triggering significant changes in the climatic and ecological layers of the biosphere (Graham, 2008).

The mid-20th century saw the creation of a number of ecological organisations, as people started to question the capability of the earth to sustain the affluent lifestyle of the developed world (Hill and Bowen, 1997). This escalation in attention focused on the natural world, ecology and environmental campaigning, was triggered by the emerging view that science and technology, far from providing answers to the issues facing society, was actually responsible for the escalation of environmental degradation (Hill and Bowen, 1997; Panayiota, 2009).

Rachel Carson's (1962) 'Silent Spring', that appeared in 1962, is recognised by some as one of most influential books ever published (Lear, 1998; Powell et al, 2005). Carson challenged the unrestrained and unregulated use of synthetic chemical pesticides, focusing on the highly toxic chlorinated hydrocarbons such as DDT (dichloro-diphenyl-trichloro-ethane), whilst also calling for a change in the way in which humankind viewed the natural world. This publication is now credited with starting the environmental movement (Glausiusz, 2007) and is also commended for the role it played in creating the modern sustainability movement and linking the concepts of social well-being with the economy and the environment (IISD, 2002). Although not all

of the text's achievements have been so positively received, whilst the book can be positively associated with both the environmental and sustainability movements, it also led to the banning of DDT and other chlorinated hydrocarbons which were important in the fight against Malaria (Tarverne, 2005).

In the late 1960s and early 1970s, the United Nations (UN) had begun to realise that, if the world is to overcome the increasing environmental and ecological damage inflicted on the natural world, that is affecting human development and well-being, some form of consorted international action was needed urgently. In 1972, the UN conference on the Human Environment convened in Stockholm, Sweden, representing a milestone in the growth of the environmental movement. For the first time, the UN and, importantly, its member states started to take notice of the environment and the ways in which human activity impacts upon it, recognising the key relationship between the environment and development for the first time (Satterthwaite, 2006). Although the conference is widely acknowledged as being the beginning of the political and public awareness of global environmental problems, the actual success achieved was minimal. None of the member states implemented the agreements reached at Stockholm, most continuing to pursue environmentally damaging development at the expense of the world's eco-system.

Whilst the United Nations (UN) conference failed to achieve immediate improvements to the member states' approach to development, the conference did significantly improve public awareness of the ongoing destruction of the natural world, which can be credited with the growth of two environmental pressure groups, Greenpeace and Friends of the Earth. Whilst both groups are clearly politically motivated rather than scientifically led, they nonetheless ensured that public awareness of the destruction of the planet's environment was maintained.

The two group's membership significantly increased amidst the public outrage following several major environmental discoveries and disasters in the late 1970s and early 1980s. The first, significantly less damaging nuclear disaster, occurred in 1979 at the US Three Mile Island nuclear plant, where a malfunction caused the second reactor core to melt and destroy the plant's number two cooler (World Nuclear Association, 2010). This was followed in 1985 by the scientific discovery of a major hole in the atmosphere above Antarctica and subsequently, in 1986, by the Chernobyl nuclear disaster, triggered by a flawed reactor design, that led to a major release of nuclear

fallout into the atmosphere. The collective effect of these incidents was a heightened sense of public despair at the way in which the world was being abused by human development (IISD, 2002), which once again pushed environmental protection to the top of the political agenda. Indeed, the Chairman of the commission articulates in her introduction that she feels the commission's creation was the UN's response to

> *"A clear demonstration of the widespread feeling of frustration and inadequacy in the international community about our own ability to address vital global issues and deal effectively with them" (WCED, 1987).*

It became clear that concerted international efforts were once again required to halt the destruction of the plant's ecology. However, unlike in Stockholm, the UN and its member states realised that action rather than simply rhetoric was needed.

The UN Secretary General formed the World Commission on Environment and Development (WCED) in December 1983. Working under the chairpersonship of Gro Harlem Brundtland, the then Prime Minister of Norway, the commission was convened in response to an urgent resolution by the UN General Assembly to *propose long term environmental strategies for achieving sustainable development by the year 2000 and beyond.* The work of the commission resulted in the publication of a report entitled *Our Common Future*, commonly referred to as the Brundtland report, named after the chairperson of the commission, from which emerged a new definition of sustainability:

> *"Sustainable development seeks to meet the needs and aspirations of the present without compromising the ability to meet those of the future" (WECD, 1987).*

Central to the report is the commission's recognition of the need for co-operation and 'multilateralism', as it called for a balance to be struck between three pillars of sustainability, arguing that, for a practice or approach to be deemed *sustainable*, it must incorporate these three pillars together with some mechanism for their assessment or quantification (Hillegas, 2010). Central to this is the condition that equal emphasis is placed on environmental protection or the protection of the existing biosphere, together with social and economic progress, which must clearly be measurable. This vague process view of sustainable development is not without its critics. Sneddon *et al* (2005) suggest that the definition's lack of precision leads to confusion regarding its meaning, and to people viewing sustainability as too difficult to achieve in practice. In this regard, the definition acts as a barrier to people changing their habits, resulting in a myriad of views, interpretations and opinions about the practical implementation of

sustainability. This cuts across disciplines due to the philosophical ontology underpinning the knowledge within those professions leading to different values and outlooks on the definition. For instance, economists tend not to align themselves with the commission's views on the interrelationship between the natural environment and economic and social performance, preferring to view human capital and natural capital as alternatives to each other rather than complementary (Becker, 1997). This major difference in focus gave rise to two very different conceptual views of sustainability; the first, *hard or strong sustainability*, is more closely aligned with the commission's view, since sustainability is viewed from a position whereby the ecosphere is sovereign. Natural resources can be used, as the commission articulates, in balance with other commodities, and can be depleted, but not at the expense of the planet, whereas *soft or weak sustainability* is more aligned with the economists' view, since human capital can be used as a substitute for natural capital, which can be depleted, though critics argue that this lack of clarity has also stunted the debate about the existence or importance of sustainability (Djalali and Vollaard, 2008).

Nonetheless, the report became a catalyst for a widespread global reaction, with the definition of sustainable development being endorsed at UN Conference on Environment and Development (UNCED), more commonly known as the Earth Summit, held in Rio de Janeiro in 1992 (Living Earth, 2010), which was seen as a significant landmark in international cooperation (ibid). Five documents were born from this summit: the Framework Convention on Climate Change, the Convention on Biodiversity, the Forest Principles, the Rio Declaration and Agenda 21.

2.2.1 Agenda 21

Agenda 21, agreed at the Earth Summit of 1992, places an obligation on all member states to develop a national sustainable development strategy and implement local strategies for the delivery of sustainable development at the grass roots level. It relates most closely to the activity taking place at a national and local level and has had the most tangible impact of these three agreements. It sets out principles for wide-ranging action on sustainable development and is described by the UN as:

> *"A comprehensive plan of action to be taken globally, nationally and locally by organisations of the United Nations System, Governments and*

Major groups in every area of which human impacts on the environment"
(1992:4).

Doyle (1998) and Du Plassis, (2001), however, question the internationalism of the document, asking how a framework, whose creators predominantly originated from the developed world can reflect the problems and solutions required by the developing world.

These problems are, however, overcome when Agenda 21 is studied. It clearly articulates that it is a *dynamic programme*, which is expected to change over time as the needs and circumstances of the world and its nations evolve. Such an approach has unfortunately resulted in a somewhat confusing framework for implementation, resulting in a document which represents a mere action plan for sustainable development (Bourdeau, 1999) rather than a more rigorous framework with which to comply. Nonetheless, Agenda 21 does place a specific onus on each country to report on its sustainable development performance. This element of Agenda 21 creates a particular approach that is designed to measure the relative performance of nations, regions and communities. The exact measurement of sustainability has remained one of the main areas of concern with regard to its implementation. Bell and Morse (1999) claim that measurement is only possible if something is defined. The exactitude of defining 'what' is to be measured is a common difficulty.

Section 40 of Agenda 21 identifies the need for improved data collection and analysis and the development of indicators of sustainable development. It is stated that the:

> *"Commonly used indictors such as the gross national product (GNP) and measurements of individual resource or pollution flows do not provide adequate indications of sustainability" (Agenda 21: 40.4).*

This implies that the indicators of sustainability must be more complex to reflect the complex nature of sustainability itself.

The International Institute for Sustainable Development (IISD), established in 1990, commissioned a group of experts to develop an approach to the on-going efforts to implement sustainability. An international group of practitioners and researchers met to discuss ways in which the sustainability agenda could be progressed. This led to the development of the Bellagio principles, a set of ten guidelines for assessing sustainability. They set out a holistic systemic approach based on an understanding of sustainability from a systems' view of the world (Hardi and Zdan, 1997). These

principles were designed to assist the implementation and assessment of Agenda 21. They advocate a holistic approach, provide a broad framework, and are effective in expanding consideration from immediate activity to far reaching impacts. They do not provide any specific guidance but strengthen the board view of sustainability that was introduced by the 'Bruntland' report in 1987.

Agenda 21 incorporates the development of a complex range of issues. The term "development" is used to indicate any human activity and Agenda 21 reflects the vast array of areas that this encompasses. It acknowledges that many of the problems and solutions addressed by Agenda 21 originate at the local level. In response to this, one objective of Agenda 21 was for all local authorities to have a local agenda 21 by 1996, achieving a consensus on what sustainable development means for the local community. The level to which this objective was met remains unclear. There are many examples of the successful implementation of a local agenda 21, and a survey conducted in 1996 established that more than 1800 local governments in 64 countries were involved in Local Agenda 21 activities (The International Council for Local Environmental Initiatives, 1997).

The adoption of this agenda reflects the global consensus and a political commitment to pursuing the ideology of sustainable development. Following the Rio event of 1992, there was significant activity towards establishing sustainable development policies. The UN established a commission on sustainable development that same year to oversee the implementation of Agenda 21. Rio+5 was held in 1997 to revisit and strengthen the commitment to Agenda 21. A new international development target was agreed, whereby each country should have a sustainable development strategy by 2002 (SDC, 2001). The meeting was a solemn reminder that little progress had been achieved and it was apparent that a lack of political will existed regarding the implementation of the more difficult aspects of sustainable development, especially those involving some sort of compromise (ENB, 1997). That same year, the member states signed the Kyoto protocol, thus committing themselves to the reduction of greenhouse gas emissions. The protocol finally came into force in 2005 and sets out a clean development mechanism for key targeted sectors, construction being identified as one of these.

There is mixed opinion on how effectively the world's nations are addressing the principles set out in Agenda 21. In 2002, the world summit on sustainable development took place in Johannesburg amidst negative publicity from many environmental groups.

The International Institute for Sustainable Development (IISD) published a report entitled *Ten and Ten* (IISD, 2002), which highlighted ten successes and ten failures since 1992. Most significant was the breakdown of the Rio agreement. Developing nations had failed to respond to the environmental problems, whilst industrialised nations had failed to remove the trade barriers to poorer nations. It is clear that, while there is agreement on the principles of sustainable development, it remains difficult to implement them. Criticism has been levelled at the international failure to react to the sustainable development agenda:

> *"Given how lacklustre and patchy the UK's record in sustainable development has been over the past 10 years, the fact that it will be one of the few countries that can hold its head in Johannesburg is an all too accurate reflection of just how little progress has been made" (Porritt, 2002).*

This is weighty criticism from the Chair of the Sustainable Development commission, the government body that was charged with promoting the delivery of sustainable development until its closure in March 2011. This comment reflects the size and scale of the problem that exists. Sustainable development remains a topic of debate between pressure groups and the government, and looks set to remain a central issue and potential source of tension between nations. The one heavily veiled benefit of this failure is that climate change and the loss of biodiversity have risen up the political agenda (Pearce, 2003:5).

A report by the Millennium Ecosystem Assessment (2005) states that 60% of the world's ecosystems are being degraded and used unsustainably, and that the harmful consequences of this may exacerbate significantly over the next 50 years. It appears that the problem addressed by sustainable development is increasing and that a more effective solution is urgently required.

2.2.2   Sustainable Development - The UK Context

The UK government claimed to be one of the first nations to respond to Agenda 21, commencing work on creating the country's sustainable development strategy in 1988 (H.M. Government, 1994:28). Yet, the UK's first sustainable development strategy was not published until 1994. Instigated by the conservative government under the leadership of John Major, this strategy ensured the UK's compliance with the

agreements made at Rio related to Agenda 21. The document laid the foundation for two decades of activity focused on the integration of sustainable development practices into the public sector, both nationally, regionally and locally. The strategy for sustainable development overlooked the importance of social progress. Instead, the assertion that sustainable development could be achieved through the interplay of economic development and environmental protection lay at the core of the policy document. Meadowcroft (2000) suggests this omission showed the international community did not fully understand the commitments it had made in Rio. This resulted in a new policy framework, representing the integration of the existing policy related to the international ecological protection debate rather than introducing a new policy framework aimed at sustainable development at a national level.

Following the 1997 general election, the UK's sustainable development strategy was re-appraised. The new document, *A better quality of life – a strategy for sustainable development in the United Kingdom,* built on the foundations laid by the conservative government for the 1994 strategy, but acknowledged the major weaknesses evident in this earlier strategy. The document articulated the importance of the social dimension in the attainment of sustainable development together with economic progress and the protection of the natural environment (DETR, 1999a). The strategy identified four fundamental objectives for the attainment of sustainable development:

(i) Social progress;
(ii) Protection of the environment;
(iii) Prudent use of natural resources; and
(iv) Economic growth and employment.

Underpinning these objectives, the strategy identified 15 headline indicators aimed at measuring the UK's performance whilst also providing a barometer of the quality of life.

Economic	Social	Environmental
Economic Growth	Educational Attainment	Green House Gas emissions
Investment	Life Expectancy	Air pollution (by days)
Employment	Housing Quality	Road traffic
	Crime	River Water Quality
		Wild Bird Population
		Land use
		Waste

Table 2.1: Headline Indictors of Sustainable Development

The UK's Local Government Act (2000) places a duty on local authorities to prepare community strategies, which 'improve or promote the economic, social and environmental wellbeing of their areas and contribute to the achievement of sustainable development'. There is freedom within the legislation to utilise either the Agenda 21 framework instigated by the UN or an alternative approach. There is evidence that local authorities are choosing not to use the agenda 21 framework, resulting in concern that the community plans might either fail to address sustainable development issues or will duplicate the past work in this area and fail to draw on the experiences and lessons acquired during the prior ten years of local agenda 21 implementation (Lucas *et al*, 2003).

The latest manifestation of the national sustainable development strategy, *Securing the Future* (DEFRA, 2005), reflects the major political change in the UK instigated by the devolution of powers to the assemblies in Scotland, Wales and Northern Ireland together with the growing awareness of climate change and the need to reduce carbon emissions. The four fundamental objectives of sustainable development were replaced by:

(i) Sustainable consumption and production;

(ii) Climate change and energy;

(iii) Protecting natural resources and enhancing the environment; and

(iv) Creating sustainable communities and a fairer world.

(DEFRA, 2005)

In addition, the policy also articulated the desire to ensure that the policy focused more on the delivery of sustainability. Acknowledging the difficulties associated with the

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existing approaches to the measurement of sustainable development progress, the number of headline indictors was increased to 20, as it was felt that the 15 existing measures provided too broad a view, preventing the actual progress from being appraised, whilst the overall number of indicators was lowered to 68 in an attempt to reduce the inefficiencies associated with duplicate assessment.

Economic	Social	Environmental
Economic Growth	Community Participation	Green House emissions
Employment	Crime	Waste
Workless Households	Child Poverty	Resource Use
	Pensioner Poverty	Wild Bird Population
	Education	Fish Stocks
	Health Inequality	Ecological Impact of Pollution
	Mobility	River Water Quality
	Wellbeing	Environmental Equality
	Social Justice	

Table 2.2: Framework Indictors of Sustainable Development

2.2.3 Sustainable Communities

The sustainable communities' policy agenda, initially proposed by New Labour subsequent to their taking of office in 1997, during the new administrations review of sustainable development subsequent to agenda 21 and other global targets, the labour government also conceded that the housing market in England was, in itself, unsustainable. In the south of the country, the market faced momentous housing shortages. Conversely, from the Midlands northwards, the market was contracting significantly, with large segments of stock evidencing high vacancy rates, falling values and, in the worse affected communities, virtual abandonment.

Aware of the need to act, together with the weakness exhibited through other housing based regeneration initiatives, the government laid the foundations for sustainable communities through the publication of three policy documents:

1. *The National Strategy for Neighbourhood Renewal* (1998), highlighting the challenges facing the poorest neighbourhoods and communities in Britain; and

2. *The   Urban   White*   Both white papers sought to implement the

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Paper   recommendations made by the Urban Task
                                                 Force.

3. Rural White Paper

In the early days of these policies, the deliberate terminology used was all about communities, which the government wanted to help to achieve their full potential, whether they were urban or rural (Conway and Johnson, 2005). The rural and urban agendas were developed in parallel until 2003, when the policy makers converged both under the government's flagship Sustainable Communities Plan.

The sustainable communities plan, launched in February 2003, was to be the government's solution to these failings, through the transformation of these problem segments of stock into 'sustainable communities', or communities in which, the government advocated:

> *"People want to live and work, now and in the future. They meet the diverse needs of existing and future residents, are sensitive to their environment, and contribute to a high quality of life. They are safe and inclusive, well planned, built and run, and offer equality of opportunity and good services for all" (DEFRA, 2005:121).*

The view expressed by the various proponents of the sustainable community plan suggests that the implementation of the policy would lead to the creation of communities that were capable of absorbing social change through self-renewal, or where the existing housing could be reused or recycled to provide a range of goods and services for modern living. As such, the aspiration was to look beyond simple investment in housing and take account of the economic, social and environmental needs of current and future generations. With this in mind, the plan focused on six principle themes:

Three centred on improvements to the housing and planning system:
- o Investment and regulation to create 'decent homes' and a greater supply of housing;
- o Planning system reform;
- o Governance delivery.

One focused on the protection of the rural local environment; and
Two focused on 'creating sustainable communities' in two particular geographic areas:
- o The HMR in the north and midlands; and
- o The Growth Areas in the South-East.

The policy also set out a programme of action for urban and rural areas, with a focus on ensuring that these communities have:

"Good quality customer-focused services, good design and deliver clean, safe, healthy and attractive environments which people can take pride in" *(ODPM, 2003:6).*

Subsequent to the publication of the sustainable communities plan, a great deal of debate has arisen both within academia and the professions affected by aspects of the overall policy framework. One fundamental area of debate relates to the plan's apparent incompatibility with sustainable development, due mainly to the promotion of large-scale stock rationalisation through the extensive demolition programmes in the north as opposed to the mass house building in the southeast. As Rydin (2007) noted, the plan appeared to place significant emphasis on societal and economically driven sustainability at the expense of ecological preservation, despite this being an important foundation of sustainability theory in order to meet its targets. Additional challenges to the plan, as documented by Power (2003), raised important concerns about, *inter alia*, community involvement and the tools for delivery, together with the important questions raised by the Chartered Institute of Housing (CIH) and Royal Town Planning Institute (RTPI) (2003) about the plan's relationship with the planning policy for housing in the context of social cohesion alongside environmental protection and economic prosperity

In 2003, Sir John Egan was invited by the government to conduct a review of the skills needed to deliver the plan. This review, published in 2004, outlined both a vision for 'sustainable communities' whilst also identifying the fundamental skills needed for their delivery (ODPM, 2004a). It also named the key components of sustainable communities together with a set of sustainable community indicators. A more comprehensive statement of the government's view of what makes a sustainable community was published in 2005 in two national strategies, *Sustainable Communities: Homes for All* and *Sustainable Communities: People, places and Prosperity* (ODPM, 2005a; 2005b) The former revised many of the sustainable communities plan's topics and updated the definition of sustainable communities. The latter sought to address policy and action regarding public services, community engagement and good governance, with empowering communities and government devolution running through its core. At the same time, each region produced a regional sustainable communities' strategy, outlining in detail the sustainable communities' regional contribution.

By 2005, creating sustainable communities had become an overarching goal and long term future vision for the UK government, as reiterated in the 2005 sustainable development strategy. However, in 2007, it dropped the 'sustainable communities' title from communications relating to this policy area (SDC, 2007). Instead, the policy area morphed into primary legislation, through the 'Sustainable Communities Act' of 2007, which made express provision for the promotion of the sustainability of local communities, starting from the principle that local people know what is best for the promotion of sustainability in their area and community, but sometimes need government support to enable them to implement their views. Since coming to power in 2010, the coalition government has sought further to strengthen this important legislation through the localism bill, which "*set out a new simple process by which councils can directly ask Whitehall to remove barriers that can block local people from improving their communities*" (DCLG, 2011:6).

However, understanding the legislative and policy agenda related to sustainable communities alone is not sufficient. If we are going to adopt refurbishment led investment strategies, which are sympathetic to the needs of the community, it is important to establish what constitutes a 'community'. Countless studies have been undertaken of the different models or types of community, all of which have observed and analysed the 'everyday lives of ordinary people' (Crow and Allan, 1995). From a sociological viewpoint, Poplin (1979:29) suggested that a community is:

> "*The place where people maintain their homes, earn their livings, rear their children and carry out most of their life activities*".

Other common definitions of a 'community' include those proposed by both Etzioni and Gilchrist, who suggest that this term:

> "*Represents a sense of mutual pride and commitment, keeping people together and in touch, it bestows both rights and obligations, promoting active citizenship and communal responsibility" (Etzioni, 1993:15).*

> "*Refers to that layer of society in which interaction takes place between people who are neither close family and friends, nor total strangers" (Gilchrist, 2002:147).*

These definitions suggest that the concept of a community usually consists of two main connotations: firstly of shared interests, such as personal affiliations and cultural heritage, and secondly of locality and place, a residential area in which people interact and live. This suggests to those tasked with the creation, management or enhancement

of sustainable communities that any strategy must consider how the existing social networks between residents will be maintained, together with the multiple levels of social interactions between different community groups, facilitated by local amenities such as local shops, faith groups, pubs and schools.

In terms of what constitutes a sustainable community, the government and other bodies have attempted to provide a list of indicators, which can be applied to communities. The first such definition, provided by the government in its sustainable communities plan, defined a sustainable community as:

> *"The way our communities develop, economically, socially and environmentally, must respect the needs of future generations as well as succeeding now. This is the key to lasting, rather than temporary solutions; to creating communities that can stand on their own feet and adapt to the changing demands of modern life. Places where people want to live and will continue to want to live" (ODPM, 2003:2).*

The plan also importantly identified 12 aspects of sustainable communities, as summarised in table 2.3 below:

Sustainable Community Requirements

1.	Flourishing local economy to provide jobs and wealth.
2.	Strong leadership to respond positively to change.
3.	Effective engagement and participation by local people, groups and businesses, especially in the planning, design and long-term stewardship of their community, and an active voluntary and community sector.
4.	Safe and healthy local environment with well-designed public and green space.
5.	Sufficient size, scale and density, and the right layout to support the basic amenities in the neighbourhood and minimise the use of resources (including land).
6.	Good public transport and other transport infrastructure within the community and links to the urban, rural and regional centres.
7.	Buildings – both individually and collectively – that can meet different needs over time and that minimise the use of resources.
8.	Well-integrated mix of decent homes of different types and tenures supporting a range of household sizes, ages and incomes.
9.	Good quality public services, including education and training opportunities, health care and community facilities (especially leisure).
10.	Adverse, vibrant and creative local culture, encouraging pride and cohesion within the community..
11.	Sense of place.

12.   Right links with the wider regional, national and international community.

Table 2.3: Requirements for Sustainable Communities (ODPM, 2003).

The Egan review (2004) went some way towards articulating the key features for progressing the government's macro level sustainable development policy framework at a local level. In doing so, Egan defined the seven key components (or 'common goals') of a sustainable community, as shown in table 2.4:

Sustainable Community Requirements

1.	**Social And Cultural**	Vibrant, harmonious and inclusive communities
2.	**Governance**	Effective and inclusive participation, representation and leadership.
3.	**Environmental**	Providing places for people to live in an environmentally friendly way.
4.	**Housing And Built Environment**	A quality built and natural environment
5.	**Transport And Connectivity**	Good transport and communication services linking people to jobs, schools, health and other services.
6.	**Economy**	A flourishing and diverse local economy
7.	**Services**	A full range of appropriate, accessible public, private, community and voluntary services

General Sub-Components

Egan identified a set of common traits or characteristics within each indicator including: all provision to be high quality, well designed and maintained, safe, accessible, adaptable and environmentally- and cost-effective.

Table 2.4: Seven requirements for a sustainable community (Egan, 2004)

Within Egan's respected review, sustainable communities were defined as communities that:

> *"Met the diverse needs of existing and future residents, their children and other users, contributed to a high quality of life and provided opportunity and choice. They achieved this in ways that made effective use of natural resources, enhanced the environment, promoted social cohesion and inclusion and strengthened economic prosperity" (Egan, 2004:7).*

The government's definition of sustainable communities was further revised in *Securing the Future* (DEFRA, 2005), which embodied the principles of local level sustainable development. Along with balancing societal, economic and ecological components, the guidance highlighted the importance of considering the wider regional and international impact and finally considered both intra and inter-generational equity, leading to the proposal of an alternative definition:

> *"People want to live and work, now and in the future. They meet the diverse needs of existing and future residents, are sensitive to their environment, and contribute to a high quality of life. They are safe and inclusive, well planned, built and run, and offer equality of opportunity and good services for all" (DEFRA, 2005:121).*

Yet, the sustainable development commission, the UK's sustainable development watchdog, criticized this definition, arguing that it should have been even more closely aligned with the government's sustainable development principles, stating that:

"We want to achieve goals of living within environmental limits and a just society and will do it by means of sustainable economy, good governance and sound science" (SDC, 2007:13).

2.2.4 Constructing a Sustainable Built Environment

The UK construction industry recognised the role it had to play in the achievement of sustainable development in the 1990s yet reacted slowly regarding complying with the agreements made in Rio.

Whilst the national strategy for sustainable development was enacted in 1994, the construction strategy did not emerge until 2000. The sustainable construction strategy, *Building a Better Quality of Life*, articulated a vision that the attainment of sustainable development and thus sustainable construction would be achieved via a joint approach. In this strategy, the government attempted to asset the significance of the strategy, pronouncing, *"It represents a landmark towards the attainment of a more socially and environmentally responsible construction industry"* (DETR, 1994). As with other policy frameworks, the document makes provision for levels of attainment to be measured through six project level indicators:

1. Operational CO_2 emissions
2. Embodied CO_2
3. Water consumption
4. Waste in the construction process
5. Biodiversity
6. Transport associated with the construction process.

In the years preceding publication, the government charged a number of departments with legislating around the ideals outlined in the UK sustainable development strategy. These changes to the legislation delivered changes in practice that have borne real benefits. Landfill tax, the climate change levy, and continuous revisions to the Building Regulations have heralded beneficial changes in the construction industry and the built environment. However, much of the action achieved to date has been voluntary, as the professions act according to their personal commitment and government guidance (The Sustainable Construction Task Group, 2003).

The government's commitment to improving sustainability within the construction industry and the built environment was reaffirmed in the revised strategy for sustainable construction, published in 2008. This strategy articulates the view that no construction project can be truly sustainable if it fails to contribute to the triple bottom line of environmental, social and economic sustainability. Whilst the strategy reaffirms the earlier end goals for sustainable development, it also provides a road map for the industry's attainment of sustainable construction. It identifies several aspects of the construction process which must be transformed, including:

o Modifications to procurement methodologies to ensure supply chain integration in a bid to reduce transaction costs.

o Calls for designers to ensure that projects are aligned with the triple bottom line view of sustainability through the delivery of buildable structures which are fit for purpose, resource efficient, sustainable, resilient, attractive and finally adaptable to changes in social trends;

o Increased innovation within the sector to increase the sustainability of both the construction process and its resultant assets;

o Increases in the number of organisations committing to structured training programmes together with improvements in health and safety on construction sites.

o Finally, better regulation of the industry to reduce the administrative burden affecting public, private and not-for-profit developments.

In support of the government's vision for the attainment of sustainable construction, both the House of Commons Business and Enterprise Select Committee (2008) and Constructing Excellence (Wolstenholme, 2009) have reaffirmed the government's view regarding the future of the construction industry, with calls for the adoption of a broader, longitudinal view, encompassing the buildings' use phase or end purpose. This, they assert, will allow the adoption of a view that relatively small capital costs can be related to significant costs downstream, in terms of both facilities management and business costs and economic, social and environmental value.

2.2.4.1 The Challenges Associated with Sustainable Construction

The construction industry has made significant progress towards embracing sustainable development since its initial conception in the 1980s. Since then, sustainability has

become the construction industry's most important and challenging issue (Dale, 2007). Yet, as Dale further asserts:

> *"The industry now faces a multiplicity of challenges, including (i) increasing public demand for sustainable products (ii) new government initiatives and targets concerning carbon emissions, as well as (iii) statistics showing that the construction and running of buildings are the biggest carbon culprits. Pressure on the construction industry to champion sustainability is increasing" (2007:22).*

It has become increasingly clear that construction organisations are now appreciating the importance of adding sustainability credentials to their business (Myers, 2005). Research undertaken by Upstream (2005) on behalf of the WWF and Insight Investment has found that speculative house builders are increasingly embracing sustainable development at a strategic level, which in turn has triggered advancements in both the design and construction of sustainable homes at project level. Whilst the report highlights significant areas for improvement, it nonetheless demonstrates that house builders are becoming aware of their environmental, social and economic impact and, importantly, are beginning to improve aspects of their processes to enhance sustainability. In support of this, Myers (2005), again using companies' annual reports, has identified the growing support for sustainability amongst larger construction firms, though he argues that this may be more closely related to corporate appearance than a shift in culture, triggered by the realisation that such organizations will be judged not only on their economic performance, but also on their commitment to environmental and social aspects. Yet, the construction industry's weak ability to integrate sustainability fully into their projects has been widely acknowledged over the last decade. A number of researchers have identified several barriers which must be overcome before the industry can be declared to be sustainable.

The most significant issue facing construction is the lack of awareness amongst built environment professionals together with the belief that sustainability is merely another term for 'environmental protection', with the terms 'green' and 'sustainable' being used interchangeably throughout the sector (Adeyeye *el al*, 2005; Presley and Meade, 2010). The second, equally significant barrier is the lack of enthusiasm exhibited by built environment professions towards sustainability and sustainable development. A number of studies, cutting across the full range of built environment professions, provides significant evidence of this trend. Adeyeye *el al*'s (2005) survey of Royal Institute of British Architects (RIBA) registered architectural practices highlighted that

the majority would only integrate sustainability if the client requested it or the legislative framework, made it a requirement. A larger survey of 800 Chartered Insititute of Building (CIOB) members identified that, whilst the majority of respondents considered themselves suitable candidates for the Chartered Environmentalist qualification, an internationally accepted professional qualification demonstrating the holder's knowledge of and commitment to environmental best practice (Society of the Environment, 2011), allowing them to function as a sustainability advisor (RICS, 2011), only 4% of respondents applied for the qualification, even though it was offered to all corporate members under grandfather rights, removing the need for a professional examination. Finally, Dixon *et al*'s (2007) comprehensive survey of the Royal Institution of Chartered Surveyors (RICS) membership discovered that only a limited number of members actively engaged with sustainability and sustainable development. Instead, the majority of chartered surveyors believe that the client and the architect are the only two stakeholders who can realistically drive sustainable construction within the project environment (Pitt *et al*, 2009).

Several studies have also attempted to appraise construction professionals' views on the relative importance of the three spheres of sustainability. Dickie and Howard's (2000) survey of 60 construction professionals revealed that the majority felt that the environmental attributes of a project were the most significant, achieving a weighting of 40%, followed by the economic ones, weighted at 30% and, finally, the social ones, weighted at 20%. Ang and Wilkinson's (2008) survey of 40 Australian property developers generated very similar results, with the respondents rating environmental sustainability as the most important, with social sustainability once again ranked third. Essa and Fortune's (2008) survey of 200 built environment professionals observed a similar ranking of environmental factors, whilst Carter (2005) reported a similar bias amongst built environment professionals working in the social housing sector. This clearly suggests that the sector still relates sustainability with environmental protection, as elucidated by Presley and Meade.

In addition to the primary barriers to sustainable construction identified so far, Willams and Dair's (2007) evaluation of five mixed use and residential projects in the South West of England identified a series of secondary barriers to sustainable construction. The research, based on an analysis of secondary data, including project documentation,

supported by interviews with key project stakeholders, identified 11 factors which were subsequently grouped into five categories:

(i)   Client awareness and demand;

(ii) Late stakeholder involvement in the project;

(iii) Limitations placed on the project by the site conditions;

(iv) Requirements of the regulatory framework; and

(v)   The cost burden associated with sustainability.

Pitt *et al's* (2009) quantitative survey of 200 RICS members reaffirms the factors identified above, with the respondents identifying the top four barriers to the achievement of sustainable construction as: financial incentives; building regulations; client awareness and client demand.

These studies highlight the significant role played by the client in the attainment of sustainable construction. It is acknowledged that, for the majority of clients, sustainability is not a critical concern (MRM solutions, 2005; Dale, 2007), with the majority commissioning projects to facilitate growth within their own business as opposed to meeting the wider market demands. As such, cost and therefore the business case for investment will dominate the decision making process (Costantino, 2006), thus leading to a situation whereby only those clients operating in certain niche markets such as social housing (Higham and Fortune, 2010; 2011) or alternatively clients commissioning major publicly funded projects such as the Welsh Assembly building (MRM solutions, 2005) or the London Olympics (ODA, 2007) will actively seek to embed sustainability within their projects. Even then, sustainability will often be a secondary consideration to the more common desire for value for money, location and function, due in part to the difficulties experienced when trying to balance the desires of the client with the triple bottom line of sustainable development (Lewis *et al*, 2006).

2.2.5 Sustainability in the Social Housing Sector

Housing agencies introduced sustainable development policies in response to the UK government's adoption of sustainability as an overarching theme. Communities Scotland developed a policy in 2000 and the Housing Corporation followed suit in 2003. The concept is well embedded in policy and the high level commitment to it is

well publicised (Housing Corporation, 2004). The *Delivering Sustainable Communities' Summit* in January 2005, hosted by the ODPM and attended by the Prime Minister, demonstrated the political importance of embedding sustainability within the social housing sector. The event brought together 2000 'experts' to debate how best to promote the objective of making housing more sustainable.

Since 1998, the social housing sector has been inundated with advice and guidance on how to deliver sustainability. The housing corporation supported 26 Innovation and Good Practice projects focused on sustainable development during 2003 (Housing Corporation, 2004). In addition, the housing forum undertook a further 49 demonstration projects related to sustainability, with the majority sourced from the social housing sector. There is political policy support for the concept and goal of sustainable development, yet there is evidence that, in general practice, this concept remains misunderstood and unsupported by many stakeholders within the procurement system (Harris and Holt, 1999:207; Sustainable Homes, 2004:2; Carter and Fortune, 2006), yet Cooper and Jones (2008) opine that built environment professionals working in the sector continue to demonstrate a willingness to engage with sustainability.

Against this backdrop, there continues to be significant growth in the number of toolkits and models emerging from academia that aim to provide practitioners with guidance on how to integrate policy and practice on the ground (Carter and Fortune, 2007). Some of these toolkits, including *The Sustainable Housing Design guide for Scotland* (Stevenson and Williams, 2007), *The Sustainability Policy Wizard* (Talbot, 2002), *A Toolkit of Indicators of Sustainable Communities* (Long and Hutchins, 2003) and *The six steps to Sustainable Development for the Social Housing Sector* (Housing Corporation, 2004), are so comprehensive that attempts to implement them at either the individual project or even strategic portfolio level would prove futile. A closer examination of the guidance reveals that they provide the practitioner with advice on every possible way of incorporating sustainability. Yet, the range of possibilities is so immense that incorporating all of the guidance into one scheme would be unattainable, and would leave the housing association with the difficulty of deciding which aspects of the guidance are most relevant and which should be incorporated or rejected. As the significant contradictory mappings of practice presented in the work of Carter and Fortune (2006; 2007); Essa and Fortune (2008) and Cooper and Jones (2008; 2009) evidence, the complication and contradiction in the guidance provided to professionals

working in the social housing sector appears to have led to significant confusion regarding how sustainability is to be attained.

The gap between the UK government's policies, strategies, initiatives, toolkits, and frameworks and the approach adopted by the social housing sector was initially explored through a quantitative survey undertaken by Carter and Fortune (2007). Focused specifically on social housing organisations that were actively undertaking development activity, the survey of 332 housing associations identified a gap in the understanding and implementation of sustainability. The results identified that built environment professionals working in the sector exhibited a strong bias towards environmental sustainability, with the survey respondents prioritising individual environmental features at the expense of social and economic features. Carter and Fortune (2007) opined that the evident imbalance in sustainable weighting might be due to the intrinsic 'social' nature of housing projects. With respondents perceiving that the sector focused on the social aspects of housing delivery, it may have been unnecessary to prioritise such features further.

In an attempt to confirm Carter and Fortune's results, Essa and Fortune's (2008) quantitative survey of 87 professionals involved in the development of new social housing projects sought to identify the features of sustainability found in typical new build housing projects. The results revealed that practitioners concentrated on providing low energy buildings as the principal way to deliver sustainable housing projects, with indicators such as energy, material, pollution and water deemed the most important, whereas indicators relating to the social and economic impact of development, such as transport and health and wellbeing, were deemed less important. Essa and Fortune's work once again evidenced a clear environmental bias towards environmental sustainability within the social housing sector. It did suggest that sustainability is actively considered amongst those involved in the delivery of new social housing development. Such findings do not, however, reflect the situation in other areas of social housing activity.

A large-scale survey compiled by Cooper and Jones (2009) as part of their evaluation of social housing maintenance practice funded by the Engineering and Physical Sciences Research Council (EPSRC) suggested that, whilst the majority of respondents felt that sustainability was an integral aspect of the maintenance decision process, this view was not translated into practice. When the same respondents were asked to rate the

suitability of the existing toolkits, ranging from conventional two-dimensional models such as the stock condition survey through to more comprehensive sustainability led frameworks such as Housing Quality Indicators and Ecohomes XB, the majority displayed a clear bias towards conventional toolkits. Such findings indicate that practitioners working in social housing asset management continue to favour tools which fail to consider sustainability adequately. However, the survey's limited focus prevents the findings from being accepted as a full mapping of the state of the art in terms of sustainable decision practice when evaluating the existing social housing sector's stock.

Nonetheless, the work of Cooper and Jones (2008) adds weight to Brandon and Lombardi's (2011:24) assertion that the existing sustainability toolkits are insufficiently developed to be applicable in practice. Yet, the findings from the large scale surveys of practice undertaken by both Carter and Fortune (2007) and Essa and Fortune (2008) directly contradict those of Cooper and Jones (2008). Although both Carter and Fortune's and Essa and Fortune's samples were restricted to professionals working on new development rather than schemes for using existing stock, the results nonetheless reveal a high incidence of professionals working in the social housing sector using the EcoHomes framework. Whilst these results suggest that the EcoHomes framework is suitable for use in practice, it is possible that the high usage levels reflect the fact that any development funded by the Housing Corporation must achieve a EcoHomes "very good" rating in order to obtain the grant. Thus, making use of this particular framework is essential, no matter how unbalanced or unsuitable it might be for the evaluation of sustainable development. The conflicting nature of Carter and Fortune (2007), Cooper and Jones (2008) and Essa and Fortune's (2008) findings called for a further investigation to be undertaken to confirm the current usage of the sustainable models, toolkits and frameworks within the social housing sector.

2.2.6   Theoretical Views on Sustainability

A great deal of academic and policy literature emerged in the ten years following the Brundtland report, concerning and articulating the core principles of sustainable development. The subject of sustainable development is one of the key research and policy issues at the beginning of the 21st century. Yet, as one may expect, there is a spectrum of views. At one end of the spectrum are those who take an *eco-centric* or

'conserve at all costs' view that puts global ecology first and limits economic and population growth in the interest of sustaining and enhancing the natural environment and resources. At the other end of the spectrum are those who advocate an *anthropo-centric* prospective, which puts human beings first, arguing that we will find a technical solution to mend the natural environment or replace natural resources. Table 2.5 illustrates these two main directions together with the sub-approaches to defining sustainable development.

ECO-CENTRIC Interpretation	• Environmental	Focusing on the consumption of resources, this approach seeks to avoid making a lasting adverse impact on the world's stock of natural resources (Meadows, 1972; Bruntland, 1987).
	• Ecological	The ecological approach emphasises the characteristics of living organisms in communities, such as the ability to self-regenerate, self-sustain and respond to change (Page, 1994; Copus and Crabtree, 1996; Ramwell and Saltburn, 1998).
ANTROPO-CENTRIC Interpretation	• Endurance	Sustainability is achieved by undertaking activities which produce lasting benefits, like training, or deal with long term problems (Thake, 1995; Aldbourne Associates, 1999).
	• Demand Based	Undertaking activities that encourage people to live in communities, equating the definition with popularity and/or quality of life (Smith and Patterson, 1999; Evans and Fordhan, 2000).
	• Environmental	This approach seeks to optimise both environmental and human resources, with an emphasis on democratic and participative outcomes. (Local Agenda 21, 1996; DETR, 1999: 2005).

Table 2.5: Competing views of sustainable development. (Long, 2000)

There has also been frequent reference, especially throughout the 1990s, to two visions of sustainability, which have differed mainly in terms of the costs incurred in attaining them: *Strong Sustainability* and *Weak Sustainability* (table 2.6). *Strong Sustainability* can be related to an *eco-centric* interpretation of sustainability and *Weak Sustainability* to the *anthropo-centric* position. Loosely speaking, *Strong Sustainability* argues that we must live within the environmental and ecological limits of our planet and trade-offs between the environmental, social and economic dimensions of sustainability are not allowed or at least restricted. Such a view of sustainability is well aligned with the environmental pressure groups' view of the problems, and is arguably grounded in the

environmental movements developed in the 1960s and 1970s, the activities of which, it has been suggested, led to the modern view of *sustainability* developed from the highly influential Bruntland Commission. *Weak Sustainability* argues that trade-offs between the key dimensions of sustainability are permissible, asserting that humanity will replace the natural capital lost through use with human-made capital.

STRONG sustainability	Takes little consideration of the financial or cost aspects of attaining sustainability and focuses mainly on the environment. Some equate this with the so-called *ecological* sustainability.
WEAK sustainability	The financial and cost aspects associated with attaining sustainability are important and typically based on a cost-benefit analysis, which inevitably involves trade-offs between the environment and other social and economic benefits. This can be equated with some sort of *economic* sustainability where the emphasis is upon the allocation of resources and levels of consumption.

Table 2.6: Interpretations of sustainability (Bell and Morse, 1999)

In practice, the development decisions of governments, businesses and other actors allow trade-offs and emphasise the economy above all other dimensions of sustainability. As a result, theorists virtually unanimously agree that *Weak Sustainability* form the conceptual basis for sustainable development (Dresner, 2002). The all-pervasive nature of neo-classical economics has also come to permeate the thinking on sustainable development, with a broad acceptance that intra-generational and inter-generational equity can only be achieved within the confines of economic growth (Common and Stagl, 2005).

Allied to the definition of the core principles of sustainability and sustainable development are the various theoretical models provided within the literature attempting to aid our understanding of sustainability. The most utilised of these theoretical models of sustainability is the triple bottom line. Originating from the field of business, this model sought to appraise the sustainability of businesses through the appraisal of their accounts, advocating that companies should prepare three lots of accounts: the traditional profit and loss bottom line, the 'people' account which is a bottom line that takes account of the company's social activities, and lastly the 'planet' account, a bottom line that reflects how environmentally responsible the organisation has proved to be (The Economist, 2009).
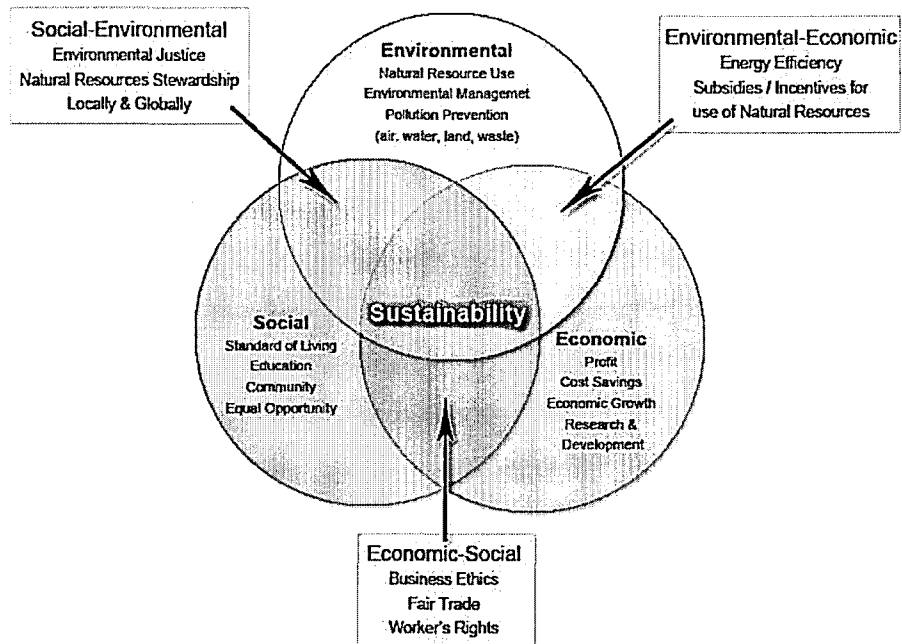
Figure 2.2: Spheres of Sustainability (Becker, 1997)

Though the model shown in figure 2.2 originated from the business world, it has now become a generally accepted model for the attainment of sustainability, as it clearly evidences the importance of the interplay between social, economic and environmental actors in the creation of sustainable development. The design of the model suggests that the three spheres of sustainability are all of equal importance, presenting the possibility of a level playing field. However, this approach has been criticised by some. Adams (2006) argues that such an approach to sustainability implies that the user can instigate trade-offs between the three essential components leading to a very weak attainment of sustainability, yet Hill and Bowen (1997) suggest that such trade-offs are fundamental to implementing the principles of sustainable development in the construction sector.

Building on the triple bottom line model of sustainability, in the first major work focused on the construction sector, Hill and Bowen (1997) suggested that the integration of the principles of sustainable development into construction projects would essentially be a decision based on the project stakeholder's value judgement. Proposing a process orientated, four-pillar model of sustainable construction, the authors argued that the level of sustainability achieved within the project was a question of the trade-offs made between the various pillars or dimensions of sustainability. As a result, the overall design and, importantly the project stakeholders' desires in terms of the level of sustainability the project is required to achieve, either weak or very strong sustainability could be achieved. Although critics of such approaches to sustainability suggest that

the facilitation of such trade-offs inevitably leads to the attainment of weak sustainability within construction projects, leading to the continuous bias towards the environmental dimension, as this is more simply obtainable (Bourdeau, 1999; Ding, 2008; UK Green Building Council, 2009). the majority of existing frameworks utilised within the built environment adopt a methodology which seeks to balance the three facets of sustainability (Poston *et al*, 2010), in an attempt to achieve a development, which balances economic costs, social change and the inevitable environmental consequences whilst also ensuring that the scarce resources are not squandered, either deliberately or through ignorance (Kelly and Hunter, 2009).

Alternate models, however, propose hierarchical approaches to sustainability. The Russian doll model shown in figure 2.3, for instance, advocates a more complex view of sustainable development. Providing an embedded view of sustainable development, it depicts the importance of the interactions between the economic, social and environment spheres (O'Riordan, 1998; Dixon, 2007). The model demonstrates the importance of economic activity to global advancement, placing this sphere of sustainable development at its core (Pearce, 2006). Yet, by placing the social and environmental spheres of sustainability on the outer rings, the model attests that economic growth should be instigated in such a way that it both enhances social progress whilst also respecting the natural limits of the earth's biosphere.
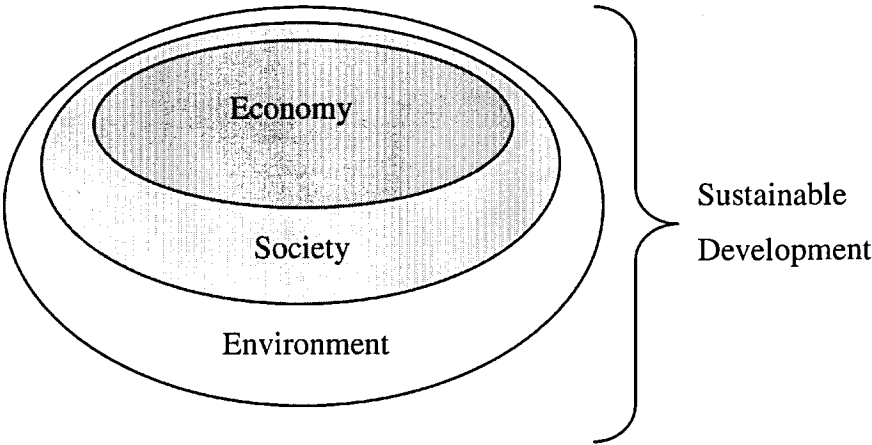
Figure 2.3: Russian Doll diagram of sustainable development (O'Riordan et al, 2001)

Wilkinson and Reed (2008), however, assert that an inverted version of the model would be more representative, as placing the natural world at the model's core would demonstrate the importance of environmental protection above all else. In any case, the

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embedded view of sustainability reduces the potential for 'win-win-win' outcomes as advocated by Brundtland, whilst also steering a path away from the weak sustainability associated with the triple bottom line, as trade-offs are less easy to make within this framework. The importance of such a view is critical to the attainment of sustainable construction if the construction sector is to co-exist with the natural world (Vanages, 2003). Adams (2006) challenges even this approach to sustainable construction, suggesting that, whilst such models attempt to develop a hierarchical structure and would appear to remove the trade-off possibilities, they do not yet depict sustainability in such a way that would foster truly sustainable development. For attain this, Adams postulates that the three spheres of sustainability must be interlocked, thereby ensuring that they become better integrated within the development decision-making process. Whilst such an approach appears to be gathering support, not least from influential political groups such as the Business and Enterprise Select Committee (2008), opponents of the instigation of strong models of sustainability suggest that trade-offs within the decision environment are unavoidable, given the diverse and often conflicting, commercial and policy objectives that can disrupt or divert the drive towards truly sustainable construction (Atkinson *et al*, 2009; Wolstenholme, 2009; Hill, 2009).

A number of authors have further commented that the issue of time is central to the concept of sustainable development in terms of measuring its progress and assessing its future configuration, with issues such as life-cycle materials, energy and cost performance considerations often being omitted (Rees, 1999; Cole, 2005). Amongst the theoretical models of sustainability, which attest the importance of time, are those proposed by both Lozano (2006) and, more recently, Moir and Carter (2012). Lozano (2006) proposed a novel visualisation of sustainability, which developed models expressed in two geometric dimensions into a single, spatially and temporally cognisant diagram composed of three geometric dimensions. Developed through a two stage evolutionary process, Lozano moved from the popular Venn diagram discussed above through a process of integration to create a singular *Strong Sustainability* orientated view which emphasises the importance of the intergenerational perspective of sustainability. This initial process generated the First Tier Sustainability Equilibrium (FTSE), a representation which shows sustainability as a strong continuously rotating circle, each dimension of which is in concurrent dynamic contact (Figure 2.4).
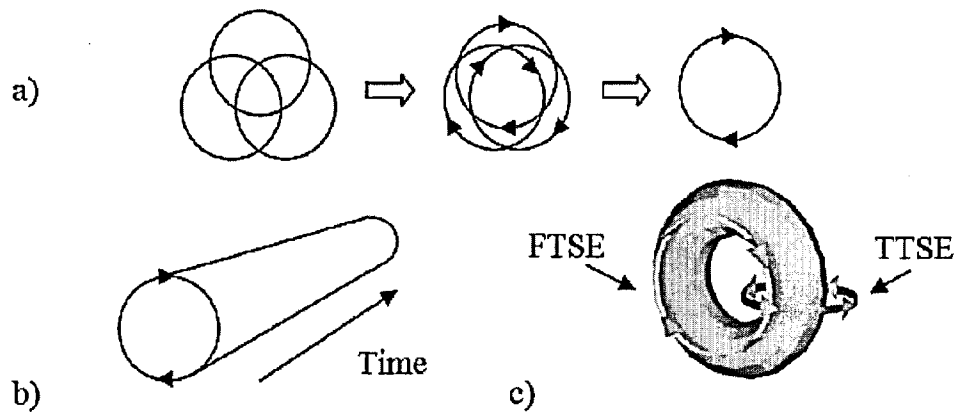
Figure 2.4: Representations of FTSE and TTSE (Moir and Carter, 2012:1483)

The second stage of the model seeks to address the need to consider the time or intergenerational dimensions of sustainability. This Lozano represents as a cylinder, arguing that there are no deviations in the interactions between the essential dimensions of sustainability. Through the adoption of this rather basic view, Lozano suggested that a temporal equilibrium has been established. Thereafter, the two equilibria (i.e. the spatial and the temporal) can be combined by "inter-relating the FTSE in dynamic change processes though time, passing from the intergenerational to the holistic prospective" (Lozano, 2006). Despite the fact that the theoretical model proposed by Lozano represents a significant shift towards the inclusion of the time dimension, which emphasises the importance of intra-generational sustainability, Moir and Carter (2012) suggest that it fails to acknowledge the importance of appropriate governance in the delivery of sustainability. The importance of this fourth dimension of sustainability, initially proposed as a result of Spangenberg's (2003; 2004) work at the Wuppertal Institute, has been identified as critical to achieving truly sustainable development, as it increases the emphasis placed on both social equity and the participative democratic and political aspects needed to deliver sustainable development.

In an attempt to enhance the initial model, Moir and Carter (2012) propose several refinements to the initial theoretical model, through a staged transitional approach which moves from a two dimensional model of sustainability towards what the authors have called a "geometric three-dimensional torus model". This transition is achieved through three principle stages (figure 2.4). At the outset, the model adopts a very traditional, Venn style view of sustainability, although the authors acknowledge the importance of governance as the fourth dimension of sustainability, placing this at the core of the equilateral triangle. The second stage, the theoretical model, proceeds to

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acknowledge the importance of spatial representation. Turcu (2010) opines that this dimension is critical to the delivery of sustainable development, as the built environment is, by definition, concerned with localities and spatial scales. The three dimensions of sustainability are now depicted as three equalised and integrated circles in continuous rotation to reaffirm that all aspects of sustainability remain in flux throughout the project lifecycle. Finally, the third stage of the model shows the two-tiered sustainability equilibrium (TTSE), adopted from the theoretical model proposed by Lozano, although the authors assert that the addition of the first two stages ensures that the governance dimension of sustainability is fully embodied in this final stage (Moir and Carter, 2012:1485).
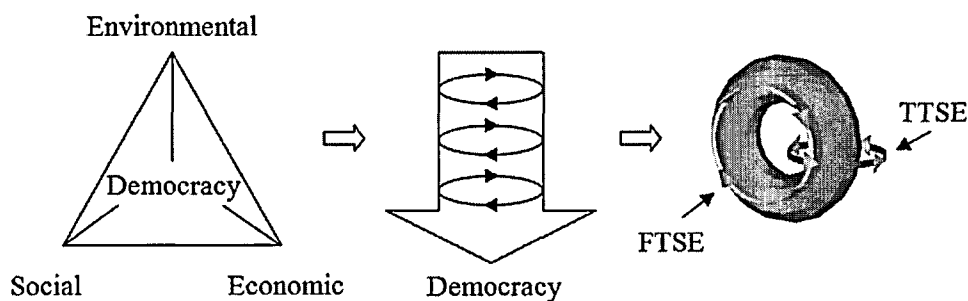
Figure 2.5: Conflated model of sustainability (Moir and Carter, 2012)

Yet, despite the fact that such three-dimensional theoretical models of sustainability provide a clear framework for its long-term appraisal, in which its dimensions appear to be interlocked, as advocated by Adams (2006), critics such as Turcu (2010:55) question the validity of such inter-generational views of sustainability, as the models fail to define the time horizon over which they view the problem whilst also lacking sufficient clarity to allow the user to determine the medium and long terms views of sustainability, which could arguably differ as the built environment copes with the changes brought about by deterioration, social and economic change and other forms of obsolescence. This, together with the popularity of the short term, two-dimensional view of sustainability, often favoured by policy makers and construction professionals, would appear to suggest that such models are unlikely to be adopted until a significant body of work has been developed to evidence the reliability of such long-term views. Yet, the empirical research completed in the social policy area, such as the longitudinal studies of social housing estates undertaken by Professor Ann Power, would appear to validate the potential benefits of such frameworks.

2.2.7 Sustainability toolkits

Estimates suggest that some 600 possible frameworks exist for the measurement of sustainable development (Sue-Mot, n.d.). For the most part, sustainability is addressed through a highly diverse arrangement of toolkits, definitions, conceptualisations and frameworks. With the majority providing such varied views of sustainability, they are in conflict with each other (Vanegas, 2003). Such conflicts between evaluation methodologies have thus far prevented any form of meaningful comprehensive evaluation of all of the possible frameworks in existence. Indeed, Poston *et al* (2010) chart the development of theoretical frameworks, defining them as either *green building rating systems* such as BREEAM or the more recent holistic approaches, which they categorise as *sustainable assessment models*. Although this section does not seek to repeat the work of Poston and colleagues, it is nonetheless important to consider the more seminal sustainable assessment models, based on the view that they advocate a framework for the attainment of sustainable development.

As part of the £3 million EPSRC funded Sue-Mot project, seeking, *inter alia*, to evaluate the existing sustainability metrics, models and toolkits. A comprehensive review of the existing frameworks was undertaken by Levett-Therivel (2004) and the BRE (Building Research Establishment) (Horner, 2004). An exhaustive literature review, undertaken by teams at Glasgow Caledonian, Dundee and Loughborough, identified in excess of 600 possible toolkits that:

> *"Measured or evaluated in some way the environmental, economic or social dimensions of sustainability. Some of the tools identified contained all three dimensions whilst others had one or two. The tools were relevant to a number of aspects of sustainability such as urban planning, design or building performance. The tools were relevant to one or more phases of the life cycle of a building or urban development. The type of tools varied and was represented in different categories. Project level tools were included that looked at specific building performance issues such as energy performance, whilst others considered the life cycle of a building or development. Whilst these tools are not mutually exclusive in their coverage of environmental or other issues, there can be differences in the use and users of such tools" (Levett-Therivel, 2004:53).*

From the initial 600 identified toolkits, approximately 250 where deemed to be sufficiently developed to be applicable in practice, with sufficient information provided to facilitate a further comprehensive evaluation by the project team. However, from these 250, the two project teams only identified 78 social and economic and a further 25 environmental toolkits as being sufficiently developed to be usable.

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Since the work of Sue-Mot, a number of authors have attempted further to refine the number of potential frameworks applicable to sustainable development and sustainable construction. For instance, Brandon and Lombari (2011:92-93) included a 'directory of sustainable assessment methods' in their seminal work on sustainable development. The directory identified 61 potential frameworks and models for the evaluation of sustainable development, whereas Turcu (2013:705) suggests that only six potential frameworks can realistically be applied in housing regeneration schemes, although it is unclear if this was a comprehensive review, as the work approached the problem from a social policy angle with a specific focus on the identification of the essential features of sustainable communities.

In selecting the frameworks for analysis, Essa (2008:30) asserted that only the more notable methods and tools should be evaluated together with those relevant to the specific research question. Over the last decade, a number of researchers (Carter, 2005; Essa, 2008; Brandon and Lombari, 2011; Dixon, 2012; Turcu, 2013) have either attempted to devise frameworks for the sustainable evaluation of housing led projects or commented on such frameworks as part of a wider study. Collectively, these studies have identified 34 potential frameworks which appeared to be sufficiently developed to be evaluated. However, a further review of these potential frameworks, as part of this study, eliminated 21 of these frameworks, due to the lack of current information regarding how they were to be applied, a lack of alignment with the aim of the study, their focus on a limited view of sustainability or because they are fully evaluated elsewhere in this thesis. As a result, this section evaluates 13 toolkits, frameworks or models that have been identified as being the closest to meeting the overall aim of the study.

The BRE (Building Research Establishment) launched its environmental assessment tool in 1990, BREEAM, which is used to assess the environmental impact of buildings. The application has been developed specifically for housing under the name Ecohomes. The assessment method aims to balance environmental performance with quality of life indicators. The issues assessed are grouped into seven categories: energy, water, pollution, materials, transport, ecology and land use, and health and well-being. Following a formal assessment, a building is rated on a scale of Pass, Good, Very Good or Excellent. The Housing Corporation, now the Homes and Communities Agency, set a sector target in 2005, which required all new social housing development to adopt the

Ecohomes rating. All new projects seeking public funding needed to attain a 'good' Ecohomes rating (Housing Corporation, 2005).

The heavy environmental focus, use of a total aggregate score or rating and concerns about the robustness of the methodology have led to criticism that the model may mask certain unsustainable aspects of development and, in extreme cases, possibly lead to unsustainable solutions being erroneously deemed sustainable (Wilson and Smith, 2005). A view further, advocated by Rees (2009), suggests that the tools themselves are flawed. Rees asserts that these systems routinely incorrectly label buildings as 'sustainable' when the opposite is normally the case. The basis of Rees' (2009) assertions lies in the underpinning philosophy of these techniques. Whilst accepting that the techniques correctly consider the greening of the building by evaluating how technological advancements are integrated into the design, he also suggests that the critical flaw in their design is that they often overlook other significant variables which could contribute to the building's overall sustainability. For instance, Rees asserts that, whilst the median family size has reduced, the demand for space has increased by a factor of three, yet this is not factored into the appraisal techniques. leading to a situation whereby oversized buildings, which require a significantly increased amount of natural resources compared with a suitably sized building, would still be rated "sustainable" as they utilise sufficient quantities of technologically advanced material when, in fact, all that has happened is a trade-off between quality and quantity, so that any environmental benefits from the technological advancements made in individual components are neutralised as the building will still be ecologically damaging due to its scale.

Yet, those supporting the BREEAM framework, such as Reed *et al* (2009), assert that, despite the limited focus associated with environment assessment models such as BREEAM, these models do provide an excellent proxy for the enhanced attainment of sustainable development within the built environment. Central to this assertion is the argument that engagement with such models is highly likely to create an increased awareness and understanding amongst practitioners. Although primarily related to environmental issues, this awareness can, however, be eventually broadened to consider the wider aspects of sustainable development, a process which Thomson *et al* (2010) argue is critical to the eventual delivery of truly sustainable construction. Early snapshots of practice further validate this argument. Indeed, Dixon *et al*'s (2008) comprehensive survey of the Royal Institution of Chartered Surveyors membership

reaffirms this point, identifying as it does that, whilst only a limited number of members appear to engage with sustainability and, in most cases, even this limited engagement tends to have been triggered by a requirement to implement environmental impact assessments such as BREEAM.

Despite the clear emergence of two highly contrasting views of the environmental assessment models such as BREEAM, Schweber (2013) argues that environmental assessment frameworks have been generally well received in practice. Adopting a multiple case study methodology, Schweber appraised eight independent projects drawn from a cross section of different building types, including recreational, educational, office and medical buildings, in an attempt to evaluate how the inclusion of the BREEAM framework within the project environment influenced both the client and the project delivery team. The research suggested that the inclusion of the BREEAM framework and, importantly, the BREEAM assessor provided a framework around which the project team came together to debate sustainable aspects of the building that would otherwise have been overlooked, although Schweber (2013) did acknowledge that such positive, outcomes would be equally dependent on each team member's understanding and awareness of sustainability.

Building on the earlier advances associated with imposing the Ecohomes attainment standard on social housing, the Housing Corporation commissioned the development of a standard, derived from the BRE EcoHomes methodology, the new assessment framework, EcoHomes XB, now replaced by the BREEAM Domestic Refurbishment (BRE, 2013), which placed specific emphasis on the assessment of environmental sustainability within the area of planned maintenance and small scale refurbishment projects. As with the BREEAM methodology, the assessment framework sought to appraise the environmental sustainability of potential projects using a rating system based around a series of indicators, which include: Management, Energy, Transport, Pollution, Water, Health and Well-being, and finally Waste.

The model clearly marks a valuable step towards the sustainable benefit evaluation of asset management interventions. This is especially significant given the sector's limited integration of sustainability in its approaches to Asset Management practices (Wilson *et al*, 2008). Nonetheless, the model does have limited application in practice due its sole focus on the environmental aspects of the existing stock as confirmed by its limited scope, and reaffirmed by the Housing Corporations Director of Regulation in the

foreword to a technical advice note acknowledging the assessment framework's central limitation, attesting

> *"We commissioned BRE to develop Ecohomes XB based on the Ecohomes new build model, to enable property managers and landlords to assess the environmental efficiency of their stock, and to help them identify the potential for improvements; and to measure this improvement when works have been carried out" (Miller, 2006:3).*

Further refinement to the base model was published by Yates (2006) who, partially funded by the BRE Trust, presented a revised version of the EcoHomes XB standard (EcoHomes XBC) which focused on the evaluation of what the researchers termed 'heritage assets' yet, in reality, were defined as housing constructed in the period 1840-1919, an aspect of housing stock that is often the focus of major housing refurbishment led regeneration investment. Competing requirements for modern energy and acoustic standards, whole building performance and the effects of the durability, reliability and maintainability of the building fabric were the specific issues considered in the work. The research also sought to build on the EcoHomes XB environmental assessment tool with a specific focus on the heritage sector. The framework sets out differing benchmark profiles that practitioners can use when forming judgements about the most appropriate strategy for delivering refurbishment projects within the constraints of the demand for conservation, regulation and sustainability. Finally, the authors importantly acknowledge the importance of considering the wider implications of intervention, advocating, *"the full benefits of sustainable issues would not be seen clearly unless all the actions relating to individual houses were undertaken as part of a wider regeneration scheme"* (Yates, 2006:21). Whilst the EcoHomes XBC once again represents a highly significant contribution to knowledge, especially in the area of social housing asset management practice, leading academics such as Fortune (2008) assert that it represents the first clear shift in practice away from a check list and tick box mentality towards a more proactive management approach to the evaluation of sustainability.

Following both the success associated with the introduction of the Ecohomes environmental appraisal model in reducing the environmental impact of affordable housing projects, together with the government's enactment of the highly optimistic goal of building zero carbon homes across all tenures by 2016, the mandatory Code of Sustainable Homes was launched in April 2007, before becoming mandatory in May 2008. Building on the earlier Ecohomes standard, but with enhanced sustainable design

criteria, adopted from the previous 'life time homes' standard and the inclusion of composting facilities, this code established six levels of attainment, with level three being just above the standard required for an Ecohomes 'very good' rating, and level six reflecting the 'zero carbon' homes target. The assessment framework identified mandatory minimum standards at each level for: energy efficiency, reduced water usage, surface water management, the use of materials in construction, and waste management. Four further categories, including pollution, health and wellbeing, management, and ecology are optional, although they will contribute to the overall rating. Despite the code for sustainable homes being grounded according to the eco homes model, Essa (2008:38) suggests that the model's approach to application could result in false appraisals, or ones which mislead the eventual purchaser. At the core of Essa's objections to the model is the scoring framework. The Eco-homes assessments were carried out and presented as a single report at any time during the build, and were site specific, whereas the code for sustainable homes is dwelling type specific. As such, the sustainability assessment fails to take into consideration specific aspects of the dwelling's position and geographic location, both of which, Essa (2008) asserts, are critical in the assessment of sustainability. Further criticism of the model came from the head of the Zero Carbon Hub, who opined that:

> "The code for sustainable homes was developed by scientists for scientists . . . it includes aspects which are un-realistic and cannot be understood by end users in any market or tenure model" (Jefferson, 2013).

2.2.7.1 Socially Focused Models for the Evaluation of Sustainability

The SUE-MOT project, funded by the Engineering and Physical Sciences Research Council (EPSRC), established to find the gaps in the sustainability assessment tools used for evaluation of the urban built environment, evaluated 675 potential sustainability assessment toolkits for assisting built environment stakeholders to adopt and implement sustainability. The researchers concluded that none of toolkits adequately evaluated the full scope of sustainability (Horner, 2004; Levett-Therivel, 2004; Edum-Fotwe and Price, 2009). Brandon and Lombardi (2011:25), who opined that most of the toolkits available were "either incomplete or totally unstructured", further advocated this view in either case, asserting that the application of these toolkits was impossible. A significant gap reviewed through the comprehensive evaluation of

the economic and social sustainability frameworks (Levett-Therivel, 2004) was the dominance of environmental and economic tools, with a significant lack of emphasis on the social dimension of sustainability. Since the publication of the SUE-MOT findings, interest in the social dimension of sustainability appears to have increased, with a number of scholars seeking to enhance our understanding of how the social life of new and existing communities can be measured and improved. The most notable advance in this area have been: Edum-Fotwe and Price's (2009) proposal of a social ontology for sustainability; Liam Magee and colleagues (2012) from RMIT University, Australia's development of a Social Sustainability Survey; Dixon's (2012) work, with the Berkeley Group, on a social sustainability appraisal framework for new housing development; and finally Slater *et al*'s (2013) work with London and Quadrant Housing Association (L&Q) resulting in a social impact assessment tool for social housing regeneration projects.

Devised by Edum-Fotwe and Price (2009), the social ontology framework represents a significant output of the Sue-Mot project. In an attempt to address the obvious gap in knowledge identified during the earlier stages of the EPSRC funded research, the researchers aimed to develop a framework both to provide practice with the much-needed tools to address the societal aspects of development adequately, whilst also addressing the obvious gap in knowledge. Based on a detailed Delphic study, the researchers initially undertook an exhaustive literature review to identify the social phenomena relevant to the attainment of social sustainability. The list of identified features of social sustainability was subsequently ratified using the Delphic technique, involving a series of small focus groups each involving up to six people drawn from a population of professionals and key construction project stakeholders, including the regulatory bodies, clients, local government bodies and building occupants.

Based on the data, Edum-Fotwe and Price (2009) proposed a three-tier social ontology, looking not only at the specifics of the project, but also its wider societal impact together with the impact of the supply chain, in terms of sourcing materials and components. The ontology is largely based around Searle's (1995) assertion that social realities can be formally defined as existing in any community that has been created by individual choices and opinions. Whilst the ontology proposed is clearly grounded in the constructionist epistemology, the researchers appear to argue that the framework depicts the different social affairs in a given social domain at an abstract level, together with the attributes of the individual actors in that domain. The importance of such an

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approach, the authors argue is that, by constructing such as structure, the user can firstly establish the nature and veracity of the existing social phenomena, as well as model the effects of the proposed development on that existing socially cohesive community.

The conceptual framework makes a clear contribution to both our understanding of social sustainability, and also provides details of the possible approaches to the measurement of the social aspects of sustainability. Implementing the framework appears fraught with difficulties, due to both the complexity of the framework and the lack of guidance. By analysing the framework, it would appear that the user identifies a range of essential social sustainability features, which are subsequently added to the model under a range of pre-determined sub-categories. Once the data have been added, the variables appear to be measured, although the research report fails to explain how this is actually achieved, although potential intangibles can, be treated as externalities and thus evaluated using the principles of shadow pricing identified in the field of Environmental Economics. Finally, these scores are weighted based on the assumed importance of each sub-category and then applied before the final aggregation of the impact at each spatial scale is presented.

Despite the contribution made by the framework, the lack of objective guidance on how it is to be implemented would make this difficult in practice. This limitation, together with the lack of detail surrounding the circumstances and situations in which the defined social issues and sub-issues can be applied, the inherent confusion relating to the linkage between this framework and the other dimensions of sustainability, and finally the model's failure to identify how the financial assessment models can be integrated, suggest that further refinement to the model will be required before it can be implemented in practice.

Magee *et al* (2012) at RMIT University in Australia developed the Social Sustainability Survey, a framework devised specifically with the intention of measuring the social sustainability of local communities. Published in 2012, following extensive testing in both urban and rural communities in Australia, South East Asia and the Middle East between 2008 and 2010, the model of sustainability assessment is based around a quantitative survey tool that seeks to appraise the stakeholders' views of a pre-determined set of social sustainability indicators, including questions exploring life satisfaction, satisfaction with the neighbourhood, personal safety, and personal relationships. However, the limitations of the framework are captured by its

geographical focus. As the author acknowledges, the questions within the survey tool, including those evaluating political corruption and violence, are only relevant to communities located in what the authors term the 'global south'.

Building on the work of Magee *et al* (2012), Dixon (2012) developed a social sustainability framework in partnership with the Berkeley Group. Academically, the work sought to bridge the gap between the conceptual definitions of social sustainability and the realities of practice whilst, commercially, the tool was designed to assist the Berkeley group to meet its corporate goal of embedding 'place making' within their developments by 2020. As with the work of Magee *et al* (2012), the research adopts a positivist approach to evaluating three principle aspects of social sustainability: amenities and infrastructure; social and cultural life, and finally voice and influence. Each of these three areas was than quantitatively evaluated via a post-occupancy evaluation survey consisting of 45 questions, which seek to appraise Berkeley's customers' views of the new community created within the company's housing development. The results are then benchmarked against the nearest output area for national datasets, such as the census and national crime survey, with the variance between the two identified. The results of this comparative analysis are then communicated to the key stakeholders using a similar format to that adopted in the SPeAR model, with each of the 13 headline indicators being colour coded depending on the variance observed. Yet, despite the clear contribution that this conceptual model makes to assessing social impact, the tool is, however, limited as it is only applicable to the Berkeley group. It is highly possible that other developers may seek to measure other social phenomena, which are more appropriately aligned with their individual corporate aims. In addition, the framework fails to look backwards to the downstream impacts at the feasibility stage of project development, where arguably any social impacts can be best amended to ensure that the project delivers the desired sense of place making.

Developing Dixon's work further, Slater *et al* (2013) attempted to develop a similar post-occupancy evaluation framework for the London and Quadrant Housing Association. Like Dixon, Slater and her colleagues once again sought to evaluate place making and social sustainability but, unlike the conceptual framework developed by Dixon, which evaluated the problem from the prospective of a commercially focused volume housing developer, Slater and colleagues sought to appraise the social benefits arising from social housing regeneration projects. Despite the fact that the earlier work

of both Magee *et al* (2012) and Dixon (2012) adopted a research methodology grounded in positivism, Slater *et al* (2013) adopted a pragmatic approach to social impact evaluation. Mainly due to the limited timeframe, the methodology implemented was primarily based around the analysis of quantitative secondary data provided by the client. However, the findings were subsequently triangulated via stakeholder interviews and observational visits to regenerated neighbourhoods. Like Dixon, the framework proposed utilised the same three principle dimensions to assess sustainable regeneration but, to ensure that the framework was aligned with the clients' corporate objectives, the original indicators were replaced with features identified by the London and Quadrant's Community Investment Strategy. Unfortunately, the researchers do not explain in detail how the framework is to be implemented, so it is unclear if it follows a similar benchmarking process to that proposed by Dixon (2012), although it does appear to utilise a similar traffic light approach.

2.2.7.2 Holistic Sustainability Evaluation Models

Frameworks such as those discussed above are nonetheless constrained as a result of their failure to consider fully the holistic impacts of both environment sustainability together with the wider socio-economic features of sustainable communities, and the additional benefits associated with potential investment schemes, aspects which are likely to be highly important to a sector that is arguably grounded on social responsibility and the moral imperative often associated with its investments (Wilson *et al*, 2007). This principle failure is likely to limit its applicability to practice, even though Fortune (2008) asserts that the models provide an important step towards the aim of providing a complete tool, which will enable practitioners to integrate all aspects of sustainability fully into project delivery strategies, which is the principle aim of this thesis. The final aspect of this section reviews a number of existing models that have attempted to assess sustainability as a holistic entity, despite the fact that the comprehensive literature search undertaken as part of the Sue-Mot project (Harmer, 2004) opined that such models are extremely limited. The researcher has identified a small number of models that aim to provide a comprehensive evaluation of sustainable development.

The Housing Corporation together with the Office of the Deputy Prime Minister both adopted the toolkit of Indicators for Sustainable Communities, developed by Long and

Hutchins (2003) as the core for their guidelines on the delivery of sustainable housing projects in England. The framework identified nine headline factors, which are aimed at the wider context of the community, and the core factors of demand, reputation and crime reflect their broader application. Housing quality is built into this set of indicators but is not sufficiently useful for application in asset evaluation. The indicators of the current and future demand for housing are vital considerations with regard to sustainability. Despite the importance and currency of the indicators identified, as restated in a comprehensive evaluation of the urban sustainability indicators undertaken by Turcu (2013), Long and Hutchin fail to identify how the variables are to be evaluated, the measurement scales to be applied or the significance of each feature, through a process of weighting. As identified in the influential work of Ding (2008), such features, together with some form of linkage to financial data, are essential for project evaluation. In essence, the work leaves the housing association with the difficulty of deciding which aspects of the guidance are most relevant, which should be incorporated or rejected, and how these features are to be measured, and finally having to devise an approach for the evaluation of such variables.

Sustainability Works is a holistic sustainability appraisal resource, developed to help housing associations to increase the sustainability of their development by providing information on how to increase the sustainability within a project. Sustainability Works make use of web-based technology and provide interactive tools for writing reports to fit in with the use of Ecohomes, the Code for Sustainable Homes and various other initiatives employed in the English social housing sector. The guidance is well presented and covers a broad range of issues, including Adaptability, Durability, Accessibility, Environmental Impact, Re-use and Recyclability, Health and Well-Being, Procurement, and Asset Management. However, the resource fails to provide a clear framework for decision-making, leaving the large number of issues involved liable to overwhelm the user or simply force him/her to adopt a checklist mentality.

Initially developed with the aim of making sustainability meaningful to stakeholders, SPeAR (Sustainability Project Appraisal Routine) is a commercial tool developed by ARUP engineers (Braithwaite, 2007). It encompasses the UK sustainable development indicators, the UN environment programme indicators and the global reporting initiative indicators, using a graphical representation of sustainability (figure 2.6) for a project organised into a four quadrant diagrams, with each quadrant containing indicators for environmental protection, social equity, economic viability, and the efficient use of

natural resources. The model provides a visual profile of sustainability and is a very useful way of representing indicators so they are easily comparable (ARUP, 2004).

The SPeAR diagram illustrates the performance of groups of indicators by shading in a segment on the face. The closer that segment is to the centre of the diagram, the stronger it is in terms of sustainability. Conversely, the further away it is from the centre, the weaker the indicator segment. The diagram can be compared to a dartboard, with the aim being to have as many segments as possible closer to the centre. Behind the diagram is a series of detailed worksheets, with over 120 sub-indicators relating to social, economic, natural resource and environmental protection ratings and contributing to the overall outcome.
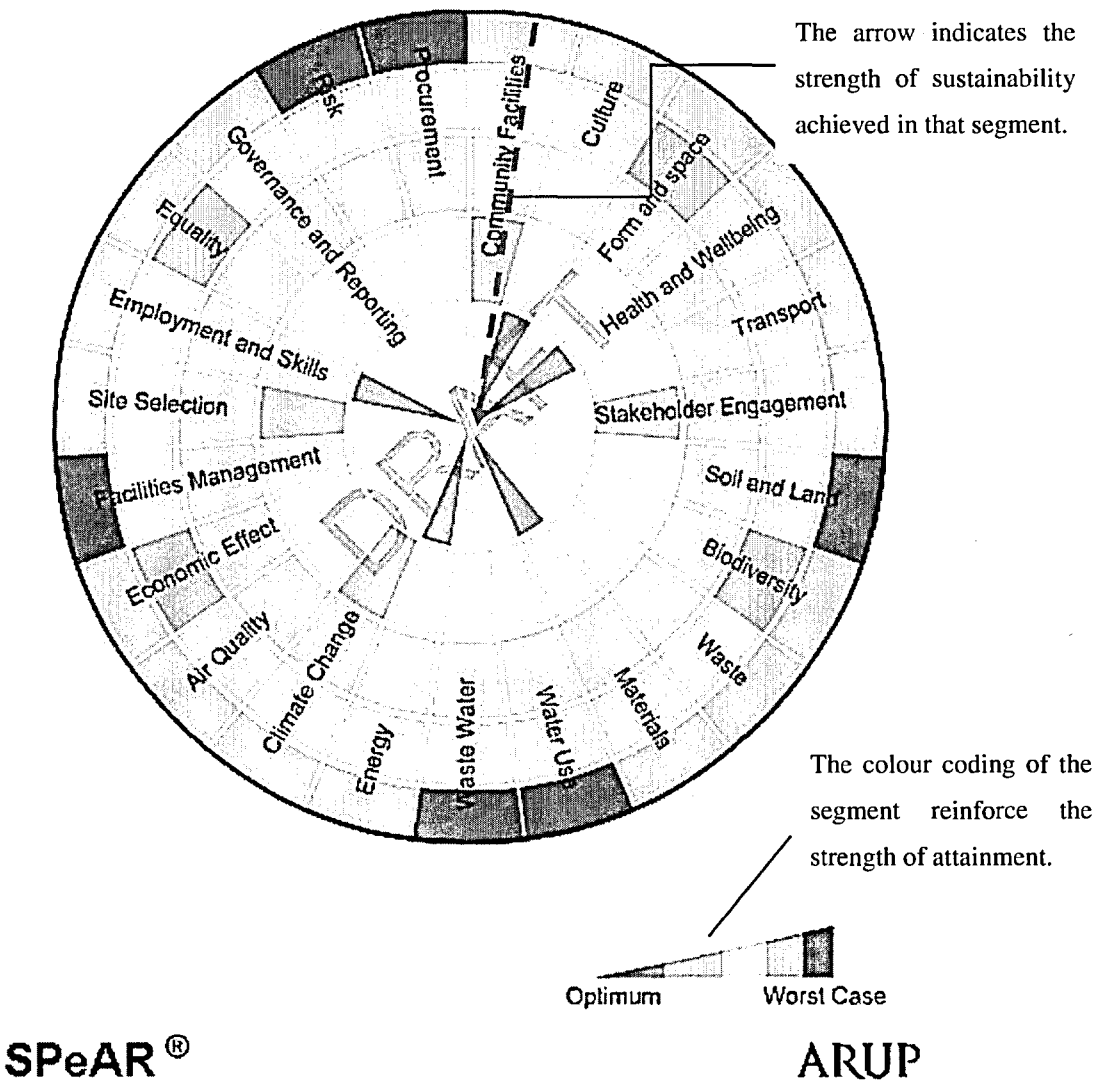
Figure 2.6: SPeAR model (ARUP, 2013).

This feature is highly commended by Dixon (2012:10), who assets that the model's approach in converting large datasets into an attractive and coherent visual tool to allow simple comparisons to be made between factors is likely to encourage a variety of stakeholders to engage with the overall sustainability approach. The indicators are built into the model and make general sense of the broad definition of sustainability. However, specific project objectives are not addressed within the model, nor does it allow comparisons between projects due to the lack of an objective rating framework, such as that used with the BREEAM model. Yet, Cole (2005) suggests that this does have benefits for users of the model, as it permits a greater level of subjectivity in the definition of performance criteria and their interpretation, allowing it to identify the strengths and weaknesses associated with a particular development. Although ARUP acknowledges this potential limitation, asserting that the SPeAR diagram is proposed as an audit tool, to enable companies to assess, at a glance, their current environmental status and to monitor improvements. an application that is clearly evidenced in Braithwaite's (2007) work. Although Braithwaite is a director of ARUP, his work nonetheless evidences the strategic benefits associated with the model's implementation, although it is based solely on one case study organisation. The research clearly evidences the model's strategic fit within organisations seeking to enhance their corporate social responsibility, yet Pearce's (2007:16) review of the model as part of his doctoral work with Halcraw Group Ltd calls its wider application into question. Pearce is highly critical of the model's applicability to organisations such as the Halcraw Group, suggesting that deficiencies such as the lack of a weighting system, absence of an integrated approach to evaluating the life cycle of the project and ignorance of key commercial sustainability indicators, including supply chain cooperation; corporate social responsibility and community participation, would prevent organisations from achieving their sustainability related objectives.

Whilst the model clearly makes a valuable contribution to the sustainable evaluation of existing assets, which is strongly aligned with the scope of the current work, the model's evident strong focus towards environmental sustainability (Pearce, 2007), together with the barriers to access, as the use of this tool is limited to ARUP's commercial clients, make it difficult for social housing practitioners to apply in practice. However, some features of the model bring significant benefits to this research. Firstly, the tool's approach to evaluation, a process facilitated by the measurement of the distance to pre-established targets in the areas of assessment, which can be established

by the project stakeholders (Council for Scientific and Industrial Research, 2001), allows the team to identify areas of benefit associated with the proposal, a key requirement for this study, together with the use of a simple traffic light system, which as Dixon (2012) attests, makes the communication of complex concepts visual and simple for lay people such as social housing tenants, and is again an important requirement for the framework developed as a outcome of this research, although Pearce (2007) does suggest that the traffic light system employed in the tool would be difficult to apply in practice due to the lack of weighting mechanisms.

Carter (2005), with financial support from the RICS and in cooperation with housing association delivery teams, identified a significant gap between the features of sustainability identified within the various policy documents, and the aspects of sustainability that professionals identified as being important within a project context, taken in this research to be the delivery of housing projects. Adopting a grounded theory approach, the researchers interviewed eight built environment professionals involved in the delivery of sustainable social housing projects, before refining the variables measured through the application of a Delphic study with a team of experts to reach a consensus on the key features of sustainability. The final framework, illustrated in Figure 2.7, identified seven emerging features of sustainability that were deemed essential for the delivery of sustainable development in the sector to be compared within a broader understanding of the concept of sustainability.
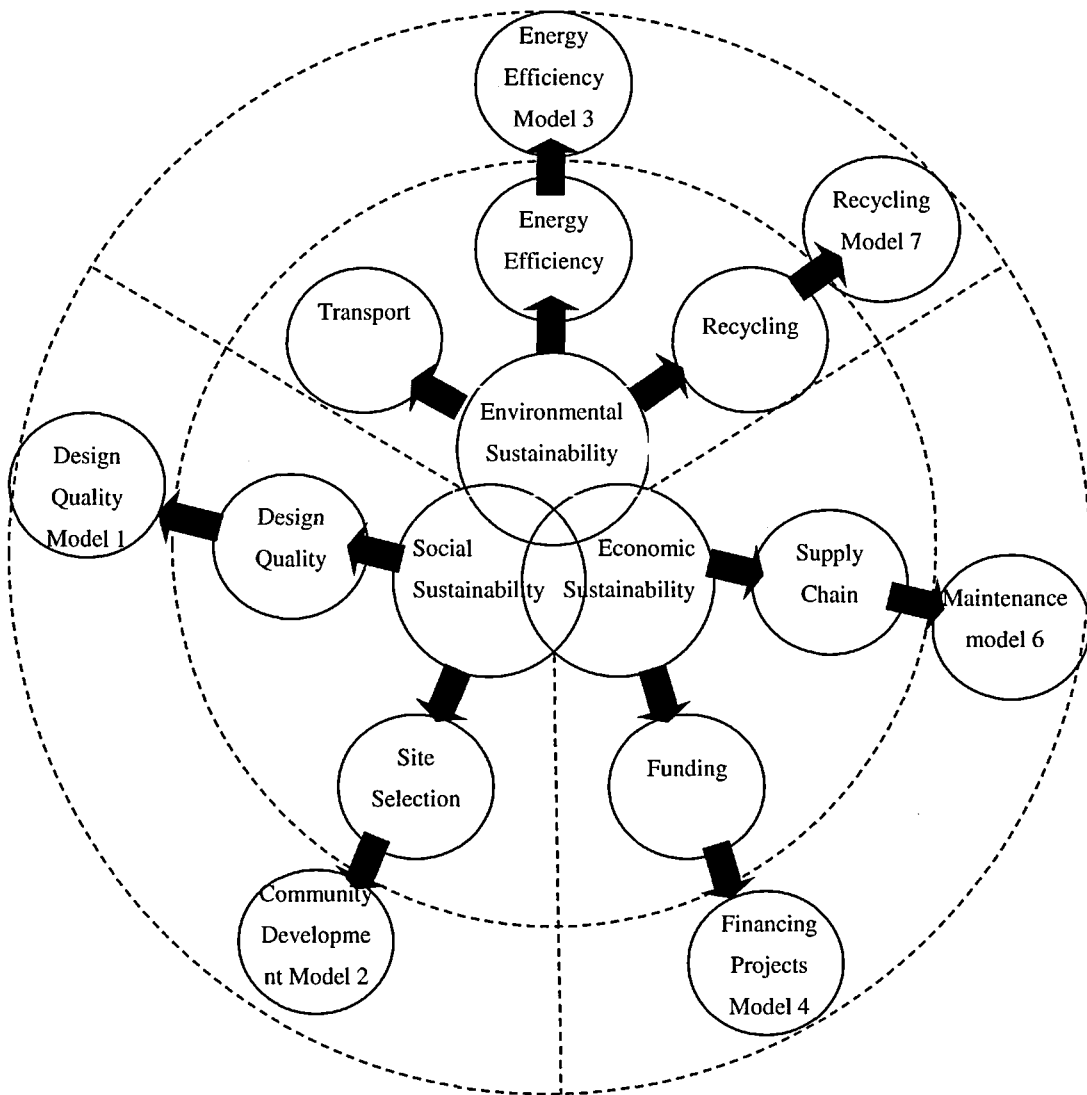
Figure 2.7: ConSus Decision Support Tool (Carter and Fortune, 2008)

Although Carter's ConSus model provides a clear enhancement of existing knowledge, since it attempts to provide a holistic appraisal model for the delivery of sustainable development within the housing sector, the framework nonetheless fails to guide users on the importance weighting or other forms of indicators that would allow them to appraise the extent to which the project under consideration achieves sustainability. As the later work of both Ding (2008) and Dixon (2012) clearly shows, some form of measurement scale and weighting system is an essential feature of such frameworks, models or tools. Although Carter (2005:305) asserts that the model is a 'group decision support tool', it remains unclear how the group decision is reached. Indeed, Green (1992) asserts that some form of quantitative framework is required to make the decision process objective and, importantly, transparent. These limitations appear to

suggest that further refinement of the ConSus model is needed before it can be implemented in practice.

2.2.8 Summary of Sustainable Development

From reviewing the literature, it is evident that the UK government is committed to the concept of sustainability and climate change. Indeed, it continues to be involved in developing and evolving strategy and policies that are key to shaping action on sustainable development. At the time of writing, the government is in the process of embedding a 'presumption in favour of sustainable development' in the national planning policy framework. The literature also identified a high level of commitment to the international policy on sustainable development and its integration.

In an attempt to translate this commitment into practice, the literature charts the ever-increasing development of new models and toolkits, which aim to assist professionals and provide more holistic early stage evaluations of potential building projects, which inform stakeholders about the sustainability of their business decisions. The lack of consensus regarding the variables to be measured, together with the many conflicts between the models proposed, in terms of both their detail and the nature of their overarching features, raises important questions about this applicability in practice. Although the later work of Carter and Fortune (2008), Edum-Fotwe and Price (2009), Magee *et al* (2012), and Dixon (2012) attempts to move the debate closer to the reality of project delivery, none have evaluated the possible application of the various dimensions of sustainability beyond new development schemes. As the SUE-MOT team asserts:

> *"Squeezing a decision into an inappropriate tool is counterproductive and may be misleading, for example if the tool excludes, devalues or misrepresents issues which are in fact important for the decision" (2004).*

The limitations evident within the existing work further reinforce the need for an additional investigation to identify the overarching features of sustainability that social housing providers need to consider when evaluating all forms of sustainable housing projects, not just those focused on the development of new affordable homes.

2.3 Asset Management

Asset management, it can be argued, is the process of guiding the acquisition, use, safeguarding and disposal of assets to make the most of their service delivery potential and manage the related risks and costs over their entire life. As such, the obvious goal of asset management is to meet a required level of service in the most cost effective manner possible, through the creation, acquisition, operation and maintenance of the building, although major refurbishment, rehabilitation and eventually disposal (through sale or demolition) also features strongly in the asset management process.

A number of definitions of asset management exist within the literature, the majority having been developed by professional institutions whose members work within the property management sector. For instance, the Institute of Asset Management states:

> *"Asset Management is the management of [primarily] physical assets (their selection, maintenance, inspection and renewal) plays a key role in determining the operational performance and profitability of industries that operate assets as part of their core business". (Institute of Asset Management, n.d.)*

Whereas Sir Michael Lyon's review of asset management in the public sector provided the following definition:

> *"Asset management is a key part of business planning which connects, at a strategic level, decisions about an organisation's business needs, the deployment of its assets and its future investment needs" (Lyon, n.d.).*

This important view of asset management articulated by Sir Michael is also very closely aligned with the definition provided by the leading professional body, the Royal Institution of Chartered Surveyors, who emphasis within their guidance to members that asset management is a:

> *"Process which aligns business and property strategies, ensuring the optimisation of an organisation's property assets in a way which best supports it key business goals and objectives" (White and Jones, 2012:9).*

Finally, the British Standards Institute provides a clear definition of asset management in PAS55-1:2008, where it is defined as:

> *"Systematic and coordinated activities and practices through which an organisation optimally and sustainably manages its assets and asset systems, their associated performance, risks and expenditures over their life cycles for the purpose of achieving its organisational strategic plan" (British Standards Institution, 2008:v).*

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Despite these well-established definitions, the variety of existing definitions of what constitutes asset management has caused confusion amongst practitioners, who tend to describe asset management in terms of property or infrastructure for which they accountable. To clarify the situation, Haas and Snelgrove (2000) proposed the following set of rudimentary guidelines on which activities constitute asset management:

> ➤ Asset management should be viewed as a process and an asset management system as the operational application or implementation of that process.
> ➤ The fundamental requirement of an asset management system by administrators and engineers is that it employs good business practices and effectively integrates or incorporates the already established component management system.

In furtherance of this view, Woodhouse (2001) describes asset management as the set of processes, tools, performance measures and shared understanding that glues the individual improvement or activities together. Simply stated, asset management fulfils a much-needed intermediate role between strategic management and operational management in any organisation. Woodhouse (2001) asserts that asset management should comprise strategic input from the senior management who will also have responsibility for strategic planning.

2.3.1 Asset Management in the Social Housing Sector

In the housing sector, the term 'asset management' first appeared formally in housing policy in 2000, where it is referred to in the government guidance (DTER, 2000a; 2000b). It later featured in the Housing Corporations regulatory framework published in 2002. The Housing Corporation stated

> *"Housing associations must operate viable businesses, with adequate recourse to financial resources to meet their current and future business and financial commitments . . . The association's business planning is informed by asset management information, which is reviewed regularly"* (*Housing Corporation, 2002*).

The regulation has subsequently been updated (Housing Corporation, 2005); however, prior to 2000, the exact origin and discourse of the term 'asset management' within the

housing association sector was difficult to place, although Brown *et al* (2002) point to the 1988 Housing Act as a possible contributor, arguing that it created a framework that implicitly required the implementation of an asset management perspective so, although there is no overt reference to asset management, the introduction of mixed funding encouraged housing associations to consider the possibility of obtaining capital income from the sales of assets (Brown *et al*, 2002). The ongoing loosening of the regulatory environment surrounding the provision of social housing has had a longer-term impact in effectively forcing social housing to function as a commercial business, faced with a fast changing dynamic trading environment with an increasingly diverse social environment from which its customers are drawn. As a result, these organisations face a significant challenge, since they are required to balance their social objectives with the harder commercial appraisals required to sustain the business which will invariably involve the production of more strategic management outputs such as corporate asset management plans.

More recently, possibly in response to the changing nature of housing practice, academia has increased its work in the area of asset management on a cross-national scale. Gruis and Nieboer (2004b:5) suggest that asset management is a concept which:

> *"Stems from the private sector where it is concerned with an analysis of the performance of organisations assets in support of decisions about holding, selling and repositioning".*

Gruis (2002), Gruis and Nieboer (2004a), and Van Der Flier and Gruis (2002) further argue that asset management, as used in the private sector, derives from the concept of portfolio management, which is routinely applied by investors, property management companies and real estate investment trusts to manage their property holdings.

Within the current regulatory and policy climate, there are varying notions depending on the context in which asset management is used. The trade body for the sector, the National Housing Federation, uses the following definition for the asset management activities in the sector:

> *"Asset Management is the effective targeting of resources to where they can have the greatest effect in raising standards, maximising value for money to deliver good quality property". (National Housing Federation, 2000).*

Building on this definition, further work on asset management has been carried out by the National Housing Federation in conjunction with the Housing Corporation which

has resulted in a good practice guide for member associations. This work provided a framework whereby housing associations could develop a successful asset management strategy. Within the guide, Tait (2003) identifies the constraints of the traditional static approach which has been adopted by housing associations in the past, which concentrates solely upon the retention and planned maintenance of the existing stock. Instead, Tait advocates that asset management in the sector should, in addition to managing the physical assets, seek to understand, evaluate and manage the existing and potential future risk to that stock, thus ensuring the long-term survival of the business. Fundamental to this long term survival is the fact that "housing stock has little or no value and cannot be considered an asset, unless there is a need now or in the future for the property or the land on which it stands" (Tait, 2003:5). Here, Tait clearly emphasises the role of demand forecasting, although this is critical to all organisations within the sector. Those housing associations operating in areas of 'low demand' should also evaluate the viability of their stock. This view is further reflected in the guidance provided by the Audit Commission (2002), who advise that asset management should include not only a detailed analysis of the physical conditions but also include the needs of both the housing stock and, most importantly, its occupants.

In his review of the risk analysis approaches within asset management practice, Gruis (2002:247) adopted the following, earlier definition of asset management proposed by Van den Broeke (1998):

> "The activities carried out by a landlord as part of a market-orientated, strategic and complete vision, which have as a goal to ensure short-term and long-term congruency between housing supply on the one hand and market demand and landlord's business goals on the other".

This places emphasis upon the market position of social landlords and the contribution of asset management to the overall business objectives of the organisation, thus considering the financial criteria used by housing associations in evaluating their stock investments.

Further work by Gruis *et al* (2004) describes asset management as concerned with the analysis of the operation of an organisation's assets by examining the decisions made about stock retention, disposal and transfer. The authors draw a distinction between the private and social rented sectors' asset management, maintaining that, in the former, financial performance is the primary goal whereas the latter is concerned with efficiency rather than economic gain. Such a view of asset management in the public sector fits the

definition advanced by Larkin (2000:8), where it is defined as "the range of activities undertaken to ensure that the housing stock meets the needs and standards now and in the future in the most efficient way". All of the definitions share a common theme: that asset management must be concerned with the future viability of an organisation's operation.

2.3.1 Theoretical Perspectives of Social Housing Asset Management

The literature relating to social housing asset management has, for some time, attempted to identify how social housing organisations devise and implement asset management from a strategic, operational and ultimately tactical prospective. Indeed, for private sector organisations, this focus is relatively simple since property management decisions are driven by the ultimate goal of optimising financial benefit yet, for the social housing sector, Mullins (2006) attests that the decision is far from clear, with significant underlying tensions within the organisation between logics of scale and efficiency on the one hand and local accountability and social objectives on the other, leading Gruis (2004) and, more recently, Morrison (2013) to opine that the literature alludes to the existence of two schools of thought in terms of social housing asset management. The first suggests that asset management is highly market orientated, whereby the organisation strategically disposes of or re-develops its stock in order effectively to manage the overall financial out-turns, whereas the second argues that asset management is task-orientated, since an organisation does not proactively seek out commercial opportunities to deal with aspects of the stock, but restricts itself to performing standard social housing tasks such as managing the existing assets and focusing on the needs of the current tenants.

The recent publication of a collection of studies which address asset management in Europe and Australia, Asset Management in the Social Rented Sector (Gruis and Nieboer, 2004a), constitutes one of the few comprehensive sources on the subject. Additionally, comparative research has been carried out between England and the Netherlands (Gruis et al, 2003, 2004; Gruis and Nieboer, 2007) and further country specific studies (Larkin, 2000; Brown et al 2002; Gruis, 2002, 2005, 2008; Gruis and Nieboer, 2004b, 2011, 2014; Albanese, 2007; Gibb and Trebeck, 2009; Overmeeren and Gruis, 2011; Morrison, 2013). Together, this body of literature provides a comprehensive evaluation of the perspective of asset management in the sector. Despite

the fact that the majority of the literature stems from Gruis, the eminent Dutch expert on housing asset management, some clear parallels can be drawn between the UK and the Netherlands in terms of the operation of the market, with the Netherlands witnessing, before the market crash, a similar weakening of the market position held by social housing providers coupled with increasing levels of owner-occupation. As such, there is clearly a shared interest in looking at and developing methods and tools for examining asset management in the social housing sector.

Examining the current practices of Dutch and English housing associations Gruis *et al* (2004) concluded that social landlords needed to respond proactively to housing market developments and so asset management strategies should reflect this. In addition, social landlords need to use systematic approaches to enable 'rational' decision making concerning their stock (that is, decisions relating to retention, demolition, transfer, or improvement) to prevent social problems and high void levels.

However, the term 'rational' brings with it many definitions and connotations, and is not a concept that should be used loosely. Gruis *et al* (2004) opine that rational decision making, within the context of asset management consists of factors that are clearly marked to inform decisions that are well structured and reported. Nonetheless, a 'rational' decision for one social housing provider could be informed by ground level information collected by neighbourhood or estate based housing officers yet, to another social housing provider, the use of statistical evidence could be deemed 'rational' within the decision making process. Consequently, the criteria discussed by Gruis *et al* (2004) are problematic.

In examining rational systematic approaches to asset management, Gruis *et al* (2004) developed a theoretical framework to categorise the potential behaviour of social housing providers into four categories: market-orientated, systematic, comprehensive, and proactive. These categories are based around general business theories such as those advocated by Aaker (1988), Ansoff (1984) and, later, Gruis and Nieboer's (2001) research in the Netherlands. The typology is further discussed in the paper by Gruis *et al* (2003) and again adopted by Gruis and Nieboer (2004c) who evaluate each of the four categories as a sliding continuum, as depicted in Table 2.7.

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Category	Observations
Market Orientated or Task Orientated	A market orientated social housing provider will place much emphasis on analysing the market demand and opportunities. Important decision-making factors in strategy formulation will be the current lettability, future market expectations, financial return and opportunities for sale. Again, a wide range of strategies will be considered and applied (e.g. including sales), and portfolio diversification according to price and quality will be a central theme of asset management. A task orientated provider will focus mainly on fulfilling 'traditional' social housing tasks: the letting of decent, affordable dwellings.
Systematic or Un-structured	A systematically operating social housing provider will devote great efforts to rational, transparent decision making. The process of formulating asset management strategies will be well structured. The decision making factors will be clearly marked and the way in which decisions are reached will be reported. This rational strategy can be contrasted with an incremental approach involving a more fragmented, smaller series of changes.
Comprehensive or Partial	A comprehensive asset management strategy will not only focus on individual dwellings or estates, but will also reflect on the composition of the stock as a whole. Furthermore, different aspects of stock management will be attuned; for example, technical and social activities, long term and short term objectives, and activities at a strategic and operational level, A partial or ad-hoc provider will focus mainly on problematic estates, will fail to formulate objectives for the development of the housing stock and will not consider (the lack of) synthesis between the different sectors of its management.
Proactive or Reactive	Proactive providers of social housing will actively seek opportunities and deal with any problems stemming from developments in the housing market, housing policy and market positions of their housing stock. They will anticipate these developments with their asset management strategies. A reactive provider will act after potential problems have become a reality.

Table 2.7: Typology of approaches to Asset Management (Gruis et al, 2003)

In adopting this typology, Gruis *et al* (2003) define what they determine to be a 'strategic' social housing provider as one who satisfies market-orientated, systematic, comprehensive and proactive approaches to asset management. Yet, in practice, such a provider is unlikely to satisfy the full range of criteria outlined by Gruis *et al* (2003). It is far more likely that social housing providers will approach asset management with a mixture of these aspects. Equally, Gruis *et al* (2003) do not appear to classify providers as 'strategic' or 'non-strategic', but expect to find that social housing providers who are

more market orientated will also have a tendency to be more proactive, although it is unclear from the research how this view has been empirically tested.

Gruis *et al*'s (2003) research then proceeds to adapt the typology framework into a theoretical model, against which cross national comparisons can be mapped, with housing associations across Europe and Australia included in the sample frame. Through the evaluation of such organisations, looking specifically at how they implement and operate their asset management systems and then describing these in a national context, the work draws a distinction between two principle variables within the theoretical framework: the *housing system* and the *housing market*. The former, the authors suggest, relates to the operation of housing policy, looking principally at regulation, financial support, legislation and historic developments. Through the development of a range of country specific monographs, together with 11 interviews with housing professionals in the Netherlands, the research proposes to locate a 'general picture' of asset management behaviour by social housing providers operating within each of the countries selected as a direct consequence of the housing system within which they operate. However, looking more closely at the English case, there are diverse housing markets at work, particularly when considering organisations that operate at the extremities of the housing market, i.e. those in the south east, with a predominantly high demand that contrasts with those in the North West, for example, where there is a low demand for stock (Barker, 2004). Therefore, caution must be exercised when developing a 'general picture'.

In adopting Kemeny's (1995, 2001) distinction between social housing systems, Gruis *et al* (2003) argue English social housing providers operate within what Kemeny classified as a 'dualist rental system', with organisations characterised to a large extent by government control through regulation and financial support. In accordance with Kemeny's definition, there is little need for such organisations to focus upon strategic asset management, as the majority of their provision will be focused towards lower income households. Exploring the case of English housing associations through secondary sources, Gruis *et al* (2003) conclude that, despite the government pressure to operate in a more business-like manner, there is little evidence to suggest that associations follow a strategic approach to asset management.

In contrast, Dutch housing associations operate in Kemeny's unitary rental market system, in which their underlying value is more closely aligned with strategic

behaviour, with providers being encouraged to adopt a more market-orientated approach. Using Kemeny's definition, it would be expected that Dutch providers operate a more strategic approach to asset management, yet this was only true to some extent. Housing associations in the Netherlands have increased their 'market orientation', but do not behave in a systematic, comprehensive or proactive manner, and so fail to satisfying all aspects of Gruis *et al*'s typology. However, there is a drive for Dutch housing associations to adopt a more strategic approach to asset management, so it is probable that their behaviour will change in the future.

Yet, since the publication of Gruis *et al*'s (2003) research, the UK social housing sector has undergone a significant transformation away from a heavily regulated, publically funded model towards an increasingly financially freestanding, commercialised approach to providing social housing (Flier and Gruis, 2002; Gruis and Nieboer, 2007), which shift in focus has had significant implications for the future identity of organisations operating in the sector (Mullins, 2010), not least in the way they approach asset management (Albanese, 2007).

In an attempt to ascertain the initial effects of this shift in focus, Albanese (2007), in conjunction with the Housing Corporation, sought to evaluate, *inter alia*, the extent to which the move towards Kemeny's unitary rental market system prompted organisations to shift their asset management strategy towards the market orientated approach outlined in Gruis *et al*'s typology. Through the evaluation of three case study organisations, using a mixture of data collection strategies, Albanese confirmed that the sector had started to adopt a 'market orientated' approach. The research suggested that as organisations develop increasing levels of commercial awareness, they transition away from the compliance model required under the dualist rental system, with senior staff learning from the mistakes associated with the 'old styles of strategic asset management' which often resulted in inefficient and un-strategic approaches to the management of the organisations' asset portfolio.

As Gibb and Trebeck (2009) observe, not all social housing providers have adopted a commercial approach to housing management, leading to an increasingly pluralistic market. In an attempt to establish the true extent of market pluralism in the Dutch social housing sector, Gruis (2008) attempted to map the various organisational architypes using Miles and Snow's (1978) seminal work on entrepreneurial strategy, that sought to evaluate the entrepreneurial strategies adopted in the commercial business

sector and identified two dominant entrepreneurial strategies, labelled *Defenders and Prospectors*. Defenders were seen as those organisations which exhibited a narrow product-market domain, in which they restricted their business focus, while Prospectors were those organisations that continually searched for opportunities outside their main market, combined with Walker's (2000) observations of the increasing organisational tension within social housing organisations faced with the challenge of operating and surviving in a fast evolving and equally quickly deregulating market, whereby the organisation would ultimately have to decide between increased commercialisation and its founding social welfare principles. Through this interaction of views, Gruis (2008) proposed a four quadrant typology of social housing organisations based on their entrepreneurial perspective, and the relationship between this business prospective and their approach to strategic asset management, as depicted in Figure 2.8.

			Commercial Orientation
Social Orientation	Defender		
	Social-housing manager Emphasis on fulfilling traditional tasks, affordability and tenant satisfaction.	*Social-housing investor* Emphasis on fulfilling traditional activities, business efficiency and yielding profit via a going-concern approach	
	Societal Innovator Emphasis on a broad range of activities, continuous renewal of its products and services and social return.	*Societal real-estate investor* Emphasis on the continuous renewal of its real-estate portfolio and financial return.	
	Prospector		

Figure 2.8: Conceptual organisational archetypes of housing associations (Nieboer and Gruis, 2011)

Applying the framework to four Dutch housing associations, selected on the basis of their fit within one of the four perspectives offered by the typology, Gruis (2008) observed that, whilst Miles and Show's (1978) defender and prospector entrepreneurial strategies could be identified within the selected organisations, he was unable to identify the separation on the social-commercial continuum between those organisations that were pursuing a traditional social welfare focus and those that were moving towards a more commercial approach. However, in subsequent research again focused on the Netherlands but, this time, adopted a mixed methodology based on both a questionnaire survey of 31 Dutch housing associations and a series of validating interviews with ten

senior professionals, Nieboer and Gruis (2011, 2014) observed that, whilst the traditional socio-economic and social strategic objectives, together with the generation of both financial and social returns remain important, social housing organisations have nonetheless begun to move away from the strong focus on commercial activities observed in the literature. Indeed, Nieboer and Gruis (2014) suggest that, as the sector becomes increasingly de-regulated, social housing organisations are starting to adopt a less commercial 'defender' position, as exhibited by the increased focus on the founding principles of managing and developing homes for low income social groups. Despite the contribution made by the research, the majority of evidence alluding to this almost backwards shift in corporate strategy is exclusively based in the Netherlands. It therefore remains unclear if this transition is also exhibited in the UK housing sector, especially since Gruis and Nieboer's (2007) comparison between the Dutch and English social housing sectors found that the Dutch organisations are not only more uniform in type, fewer in number and larger in size, but also have a greater degree of administrative and financial independence. Yet, the work of Gibb and Trebeck (2009), based on extensive case study evaluations of four social housing organisations operating in the North East of England, has suggested that the English social housing sector is undergoing major changes as organisations attempt to respond to the continuous changes in housing policy through housing transfers, organisational re-structuring, increased vertical and horizontal integration and finally merger activities, resulting in the formation of housing groups which may reduce the gap between the practice in the Netherlands and the UK observed by Gruis and Nieboer (2007), raising the possibility that, as the UK market evolves, it may follow a similar trajectory to that observed in the Netherlands by Nieboer and Gruis (2014).

Despite the literature evidencing the clear need for social housing organisations to move towards a more strategic model of asset management, through the clear distinction between market and traditional task orientated organisations (Morrison, 2013), the recent work by both Overmeeren and Gruis (2011) and Ho et al (2012) has started to question the adoption of a purely market led approach, instead highlighting the potential dangers associated with the adoption of an overly strategic approach to asset management which is principally top down in nature. Overmeeren and Gruis (2011:184) attest that, often, asset management plans are produced at the strategic level within the organisation, which fails to represent the realities of the day to day operation. As a result of this disconnection, the decision-making becomes reactive, as it adapts to

incidents and demands at the neighbourhood level. Responding to this situation, a number of Dutch housing associations moved towards a less strategic model of asset management, in which:

> *"Management decisions are not only based on portfolio considerations, but on considerations on neighbourhood level, Activities are defined in negotiation with different parties and are based on social problems, the technical quality and future market position of estates in a specific neighbourhood" (Nieboer, 2007).*

On the basis of these observations, and the growing recognition of the importance of developing area level asset management strategies, Overmeeren and Gruis (2011) developed a conceptual framework that identified five principle features of what they term *neighbourhood and value based asset management*. These include:

(1) Awareness of value	The neighbourhood is important for the living experience of people. It is the level on which the residents identify themselves with their living environment and on which outsiders form an image, so which also influences the value of the housing stock.
(2) Balancing costs and benefits	Area-based asset management makes it possible to look at costs and benefits from a broader prospective. Not only are the (direct) costs and benefits of single projects taken into account, but also the (indirect) costs and benefits of adjacent property. Within one area, unprofitable projects (i.e. social housing) can be 'subsidised' by profitable projects.
(3) Integration of Sectors	Thinking about the portfolio, the quality of public and commercial services and social structures coincide on this level, which makes it possible to develop comprehensive approaches which, in physical, social and economic measures, reinforce each other.
(4) Collaboration with (Local) stakeholders	The neighbourhood level is sufficiently concrete to debate and plan co-operation with external parties. It is often the level on which partnerships with stakeholders and urban restructuring plans are forged. Thus, neighbourhood based asset management may be better equipped to incorporate local dynamics than top-down strategic business planning.
(5) Internal Collaboration	Planning at the neighbourhood level can contribute to internal cooperation. Representatives from the 'functional' departments within the organisation (such as the maintenance department, real estate department, treasury and front desk) can work together on neighbourhood plans.

Despite the fact that the authors only tested the conceptual model on two case study neighbourhoods located in the Netherlands, the conceptual framework represents a marked move away from the purely top down strategic models. However, the importance of approaches such as that proposed by Overmeeren and Gruis (2011) has been evidenced in the empirically based work of Ho *et al* (2012), which examines the housing asset management associated with housing led urban regeneration in the four oldest districts of Hong Kong. Although focusing on only one actor group, community residents, the researchers, adopting a questionnaire survey, gathered the views of over 1500 local residents to assess the importance of neighbourhood level evaluation. The results suggest that imposing solutions on communities through strategic top down approaches to asset management will inevitably result in a weakening of community cohesion and increased disillusionment. As an alternative, the researchers advocate the adoption of community engagement through the decision process and, importantly, area based appraisals of both social conditions and community aspirations as part of the decision process.

As social housing providers in the UK move away from the mere management of their housing stock and towards wider neighbourhood level involvement, such approaches to asset management are likely to be increasingly adopted in practice.

2.3.2   The Evolution of Asset Management in Social Housing

During the 1990s, prior to the increased interest in asset management among both academics and policy makers, there was a realisation by those professionals working in housing associations, the local authorities and government that, in the North and the Midlands, there existed a severe lack of demand for certain properties. Prompted by the high levels of unlettable stock together with a clear fear about the potential impact on businesses, there is evidence to suggest that housing associations began to respond internally to the low demand phenomenon through engaging in more intensive partnerships related to housing management. Cole and Shayer (1998) found evidence of joint management practices on the Bessemer Park Estate in County Durham, after redevelopment began in 1992 as part of the Estate Action programme to prevent further decline.

Although the idea of asset management has been suggested since changes in policy in 1988, it is the issue of Low Demand which prompted the social housing providers in these areas to intensify their strategies and explicitly discuss asset management. Subsequently, a series of measures were introduced to tackle the low demand by the then labour government, most notably the determination of 9 pathfinder areas in the North and Midlands, as outlined in the Sustainable Communities Building for the Future (ODPM, 2003) funding proposal. Together with the subsequent investment of over £3 billion, this was unexpectedly ended in the 2010 spending review by the coalition government.

Yet, in terms of stock management, the housing green paper, *Quality and Choice: a Decent Home for All: the Way Forward for Housing* (DETR, 2000c), provided a mechanism that allowed the government to require social housing providers to improve housing conditions, update facilities and improve the thermal comfort provided to tenants (Kempton, 2004), in effect outlining the need for the social housing sector to review and rationalise its existing stock. The Audit Commission (2002) further advised that any evaluation would be required to include a detailed knowledge analysis of both the condition and needs of the housing stock and, in particular, its occupants. Through the green paper and the sector target, requiring all social housing to meet set decency standards by 2010, the government finally recognised that changes in the housing market and the low demand for properties in certain areas had brought the issues of housing management and, in extreme cases, the viability of some housing associations to the fore (Kiddle, 2002).

In contrast to the low level of demand in parts of the North and Midlands, Barker's (2004) review of the housing supply, commissioned by the government, alluded to the distinct lack of housing supply, across tenures, particularly in the Southeast of England. This, coupled with the high land values, effectively chalked off potential growth amongst social housing providers operating in the market, which further impacted on the availability of affordable housing in these communities.

The above emphasises the need for social housing providers to consider their asset management strategy in the wider context of their long-term business plan. Although the formal guidance highlighted the importance of asset management for all providers, it is important to stress that the issue of low demand prompted those organisations that were struggling to let properties to tackle the issue of asset management due to the need

to manage their stock portfolios. For those organisations, and especially smaller locally based associations, asset management was important because, if not addressed, the poorly managed stock investment would drain the resources and potentially lead to bankruptcy.

2.3.3 The Characteristics of a Low Demand for Stock

Changes in the market conditions within which social housing providers operate have increased the risks associated with the management of the property portfolio. In the late 1990s and into the early 21st century, a number of social housing providers, especially those located in the North and Midlands (Bramley and Pawson, 2002; Lee and Nevin, 2003), noticed a significant decline in the demand for rented housing stock across all tenures. Yet, as the political and policy rhetoric once again moved away from the problems associated with unpopular housing, very little research has been undertaken to map the longitudinal impacts associated with economic change on these complex issues. Attempting to evaluate the full extent of the problem, the government commissioned seminal research by Bramley *et al* (2000), who estimated that some 850,000 dwellings, across all sectors of the housing market, were experiencing problems directly linked to the low demand existing at the start of the 21st century. In spite of this, Cole and Nevin (2004) have questioned the validity of the study's methodology. At the core of their concern is the researchers' approach to the data collection, which asked local authorities to identify individual properties which in their opinion could be categorised as exhibiting low demand. Cole and Nevin (ibid) suggest that this strategy caused the researchers to overestimate the scale of the problem. These concerns do not, however, appear to have been realised, as data from the Empty Homes Agency (2009) confirms the original figures with an estimate that 937,000 properties are currently affected by 'low demand'.

Low demand for housing in an area is a phenomenon which cuts across the environmental, social and economic aspects of sustainability (CPRE, 2004), manifesting itself within the housing stock in a multiplicity of ways. In an attempt to aid the practitioner, the DETR (1999) provided two sets of headline indicators for low demand. For the private sector, low demand, it was suggested, would be exhibited through the occurrence of the following factors:

> *"Particularly low or falling in absolute terms; the community exhibits a high void rate; high population turnover; a significant long-term private*

sector voids or abandoned properties can be observed together with a visibly high instance of property for sale or available for rental" (DETR, 1999:4).

Looking at the social housing sector, low demand would be indicated by:

"Small or non-existent waiting list; tenancy offers are frequently refused; high rate of voids available for letting; high rate of tenancy turnover" (DETR, 1999:7).

Whilst policy makers provide these definitions of low demand, academia has suggested that they fail to reflect the scale of the problem that social housing must consider when evaluating the housing stock. Instead, the academic literature (Nevin *et al*, 2001; Leather *et al*, 2003) has focused on the social phenomena affecting social housing, especially in Northern England. Several factors have been purposed, including the physical condition, location, availability of services, and the possible threat of demolition. Whilst some are clearly critical of this definition, it must be accepted that no 'one fit all' definition will ever manage to be sufficiently holistic in considering all contributory factors.

Over and above the official indicators of low demand, however, a myriad of additional contributory factors have been recognized within the literature. The seminal work by Power (1999), adopting a social anthropology approach, evaluated 50 social housing estates across five European countries using a combination of observational case studies and stakeholder interviews. It identified that the interplay between physical characteristics, social and local economic variables heavily influence the demise of the estates' popularity. In furtherance of this, Lupton (2003), who appraised 12 UK estates using a mixed methodology consisting of observational case studies, stakeholder interviews and quantitative analysis of secondary data, later confirmed Power's earlier findings, although she contested the assertion that the design of the physical built environment contributed to the decline. The findings of both Power's seminal study and Lupton's later survey of English estates agreed that low demand is triggered by a multiplicity of interlinked factors which can be loosely clustered as follows:

1. The physical environment: including factors such as levels of disrepair, residents propensity to undertake maintenance interventions, room sizes and layouts, uniformity in design, density, a lack of parking and the supply of substitute goods

2. Management of the stock; focused towards the social housing sector and the management of estates and delivery of services.

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3. Financial issues: including those relating to the costs associated with the creation of decent homes and the undertaking of routine maintenance operations.

4. The demising social gel: specifically, the levels of crime, anti-social behaviour, littering, and economic restructuring leading to reduced employment opportunities, lack of public transport and finally problems associated with what Bramley *et al* (2004) term residualisation or the stigma associated with certain types of housing or geographical locations.

5. The mismanagement of planning legislation by local authorities has led to a housing oversupply in many towns, exacerbating the problems at the bottom of the housing market. The result of this mismanagement and oversupply of housing has had significant implications for the operation of the housing market. The properties now labelled as obsolete would have been traditional starter homes for first time buyers, resulting in this group being attracted away from these typical starter homes by a combination of packages offered by developers (Goodchild and Karn, 1996) and their ability to purchase a property which would be more reflective of their own desires (Stephenson and Carrick, 2006).

The most crucial outcome of low demand is the increased competition for tenants across both sectors, which has been further exacerbated by the emergence of mixed tenure estates. Consequently, landlords must strategically assess how they manage their stock, looking at issues such as their tenant profile, areas of operation, financial viability and wider regeneration issues. Looking more specifically at the housing association sector, low demand has been a particular problem for landlords, based on their increased exposure to risk, the tensions between their social objectives and financial viability, and the small area focus within which many associations operate.

Furthermore, the work adds significant weight to the Audit Commission's assertion that asset management appraisals and specifically investment decisions need to be undertaken at a neighbourhood level whilst also moving away from broad policy or out of date stock condition surveys towards a more holistic evaluation of value based benefits.

2.3.4 Asset Evaluation Tools; Frameworks and Models

It is becoming increasingly clear that improving the sustainable performance of existing social housing stock is a key challenge facing many public housing organisations. It is imperative that investment decisions ensure that the environmental and social benefits

associated with the investment are fully balanced with the pre-determined economic restrictions, which are inevitable within any project. Over the last six decades, a number of researchers have developed various tools in an attempt to provide a suitable model for housing investment decision making. These theoretical developments can be clearly stratified into loose generational clusters, leading to the following timeline for development:

Pre-1965	Traditional approaches derived from general real estate and construction practice, and applied to housing.
1965-1980	Mathematical and probabilistic models adopting a largely economic approach to the appraisal of stock investment with the price signal adopted as the indicator. Such models often only propose slight amendments to the conventional feasibility evaluation techniques.
1980-2000	Introduction of value orientated approaches to appraisal, often aligned with regulatory policy ideas related to investment funding. Social and environmental considerations start to feature in models and frameworks.
2000 onwards	Sustainability assessment models introduced aligned with the needs of sustainable communities.

2.3.4.1   *Economic Frameworks for Asset Evaluation*

Investment feasibility calculations for new-build or rehabilitation projects in the built environment are most commonly undertaken using discounted cash flow (DCF) analysis, whereby all of the present and future cash inflows and outflows are manipulated according to the methods of present worth, annual worth, future worth, internal rate of return or payback period (Carmichael and Balatbat, 2008). The difficulties encountered when applying these generic techniques within the specialist domain of housing has led a number of researchers to propose modifications to these standard approaches in an attempt to devise frameworks within the viability of stock reinvestment that can be fully evaluated.

Prior to 1980, these models largely adopted a purely economic approach to the appraisal of property investment decisions. The first, proposed in the seminal work of Needleman (1965), provided a purely economic tool, which facilitated the evaluation of possible investment levels. The Needleman model restricted itself to the demolition and

rebuilding or various levels of refurbishment based on their capital cost, with the aim of devising the most appropriate approach. Whilst this work presented the first such model, several modifications were later proposed, including Sigsworth and Wilkinson's (1967) amendment to include both the investment value of the existing building and the inflationary cost increases, and Schaaf's (1969) suggestion that depreciation should be included within the formulation. In 1970, Needleman once again reviewed his initial formulation, this time proposing an extended formula which gave increased treatment to the factors influencing the rehabilitation or refurbishment versus the demolition and redevelopment of the existing housing stock. In doing so, Needleman derived two formulas, one covering single building evaluation and the other, importantly, for the first time acknowledging that the local authorities and housing providers will generally often seek to undertake a wider and more strategic area or estate level evaluation. The extended Needleman formula gained official endorsement which was incorporated in the then MHLG (Ministry of housing and local government) circular 65/69. It was not, however, an unqualified endorsement, as the circular did not imply that the formula catered adequately for the differences between the standards of accommodation in the new and improved buildings.

The next step change in such investment models emanated from the work of Brookes and Hughes (1975). Responding to the evident weakness in the adopted model, Brookes and Hughes embarked on examination of the practical value of the Needleman formula, with the principle aim of exploring alternative methods of quantifying the differences in accommodation. The researchers opined that differences between the standards of accommodation are determined by the physical characteristics of buildings, which they grouped into:

❖ Differences in space and service standards
❖ Differences in the condition of the physical fabric

They then quantified the differences between these physical characteristics by estimating the additional capital outlay required to close the gap between the improved and new property. Brookes and Hughes' (1975) recognition of standards of accommodation as determined by physical characteristics represented an improvement in the applicability of the model, although the indicators of the physical characteristics proposed within the model were not stated for measurement. Despite Brookes and Hughes evidently building on the earlier limitations of Needleman's work, and

publishing their conceptual framework in 'The Town Planning Review', no further development of the initial conceptual model appears to have been published in the academic literature.

This initial focus of the work on the economics of the housing investment decision has since been called into question, not least within the paradigm shift in emphasis presented in the pivotal work of Bell (1981). Bell was critical of the earlier work, arguing that decision making should be reflective of the social and environmental importance of the proposed housing development rather than merely the economics of the decision. Bell's initial concerns have subsequently been validated by the growing body of empirical evidence, drawn from both built environment and social policy research, which highlights that unpopularity is a symptom of a combination of factors including an oversupply of housing (Paul 1998; Aggett 2005), a deterioration in physical conditions, social failings, a reduction in economic activity and lowering environmental factors (Lupton 2003; Gibb and Kearns, 2001; Wood, 2005; Keenan *et al*, 1999; Leather and Mosley, 2002; Bashford and Sear, 2004). It is clear that any framework developed to assist the asset management decision process would need to be considered and evaluated within the selected decision model.

2.3.4.2 *Value Orientated Frameworks for Asset Evaluation*

Bell's seminal work, conducted in co-operation with the Metropolitan Borough of Bolton in the North West of England and reported in 'Housing Review', attempted to implement a paradigm shift in the approach adopted for the pre-construction evaluation of housing led projects. Despite the fact that Bell's review of practice at Bolton focused on housing led regeneration projects in areas dominated by owner occupation, where the statutory requirements of the Housing Act placed significant restrictions on the use of physical intervention, Bell nonetheless observed the increasing complexity of the decisions made within the decision environment, with many decisions being impossible to make on the grounds of economic viability and statutory unfitness alone. Bell's view was that economic, social and environmental issues must be considered in making what he thought was often a very delicate judgement.

In connection with the value judgements required, Bell thought that the formulas developed by academia, from the initial seminal work of Needleman and, importantly,

those adopted by practice, such as those contained within the policy guidance issued by the then Ministry of Housing and Local Government, were largely economic in character and, importantly, failed to evaluate the full implications of any action taken with regard to the local community. The intention of Bell's approach was to use the economic models as a starting point for the consideration of what he termed 'other more practical issues' which are now recognised as the principle features of sustainable communities. The aim of Bell's work was therefore to make the many value judgements he argued to be relevant during the decision process, whilst also ensuring that these value judgements were made as explicit as possible to ensure that the local community can fully appreciate and, if necessary, interrogate the recommendations made by built environment professionals. This, Bell opined, would also ensure the avoidance of any "spurious accuracy by over quantification and the misapplication of mathematical functions".

Bell's model consisted of a number of broad systematic issues arranged in sequential steps so that each succeeding step questioned and defined the previous one, as illustrated in Figure 2.9.

The 'Bell' model worked by first assessing the options available for the property under consideration, limited to redevelopment, full rehabilitation and rehabilitation to some intermediate standard. The redevelopment option was used as the norm against which the other options were compared.

The option definition stage was followed by an assessment of the relative economic worth of the options. This assessment was carried out along two lines: a quantitative comparison of the costs and benefits and a qualitative assessment of the benefits. These were all to be measured against the redevelopment norm. In the case of Bolton, this norm was defined as the redevelopment of Parker Morris Standards as a pre-determined development density (Bell, 1981).
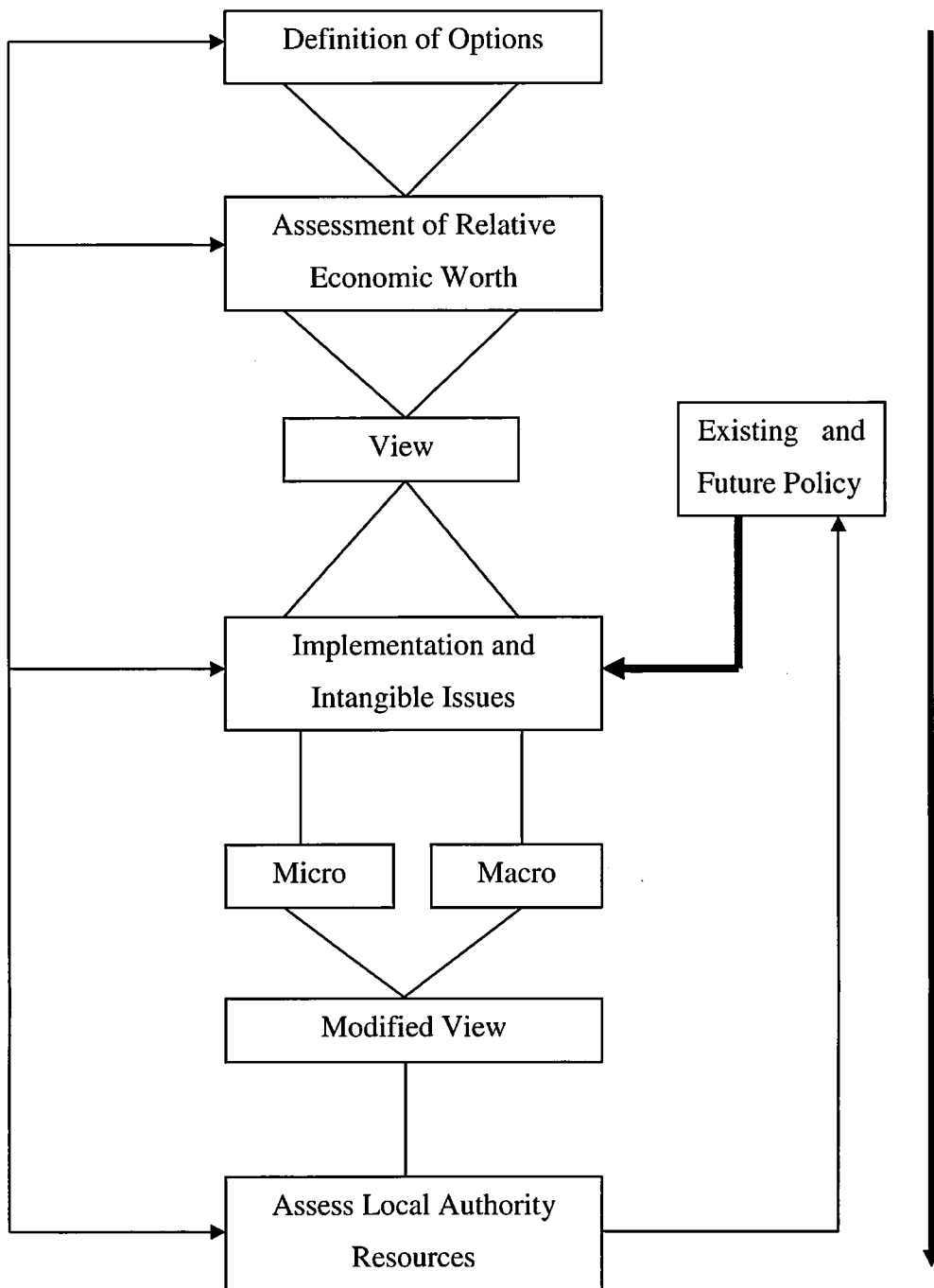
Figure 2.9: Bell's Housing Renewal Model (Bell, 1981)

The qualitative comparison was based on the method suggested by Isaccson (1976), whereby the amount worth spending on an option was determined by the ratio of the benefits of that option to the benefits of the norm. Benefit, Bell asserted, was to be measured by combining two principle factors: the number of people the scheme would house and the time needed to construct or rehabilitate the housing. Thus if, on this measure, a tested option is found to be 75% of the norm, then it would be economical to expend 75% of the cost of the norm on that particular action.

Moving through the framework proposed by Bell, the next fundamental step in the evaluation process was to determine the subjective housing quality afforded by the tested option. Three indicators were used to define this subjective quality:

1. The quality of housing based on space, layout and view;
2. Environmental quality based on external space, landscaping (hard and soft), noise, etc.;
3. The provision of local amenities, such as shops, play spaces and community facilities.

The quantitative and qualitative assessments described above were to be combined to form a single view of the situation. In forming this view, questions were to be asked regarding the trade-offs to be made in cases where the quantitative cost limit was exceeded.

The next step in the model was described as the consideration of intangibles and implementation issues, covering the situation-specific issues which vary from case to case. The assessment under this heading started with a consideration of the issues at the individual house level and then extended to cover area, district and local authority issues. These issues were divided into micro and macro issues.

According to the 'Bell' model, the micro issues involved the question of practicality in achieving the option under consideration. It involved the assessment of the likelihood of a particular owner/occupier carrying out the necessary work or of any changes of tenure affecting the achievement of the option being tested. On the other hand, the macro issues were concerned with the relationship between the area, its surroundings, other local, regional and national policies and the social and spatial issues within the area itself. Such issues may well include the existence of a community within the area and the viability of the area, given external issues such as industry and employment opportunities and the effects of any changes on factors such as local shopping.

The views formed after the identification of the intangibles and the practicalities were to be combined with the initial view formed from the previous step to define each option clearly.

At the end of the evaluation process, Bell opined that a clearer and somewhat ideal picture of the area would emerge within the constraints posed by economics, intangibles and other practical issues. As such, the final stage of the framework was the adoption of

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the final view, including the provision of sufficient resources for implementation. Alternatively, Bell, aware of the local government budget complexities, advised that, alternatively, the user could provide sufficient resources for implementation along with a further budget commitment over successive financial years to complete the regeneration programme, yet also acknowledged that what was actually achieved (against proposed at the feasibility stage) was often determined by local authority resource availability and capital funding support from the central government. As such, Bell's framework included a provision for multiple iterations of the decision, based on financial restrictions. The implications of resource availability can therefore be fed back into the earlier stages to establish a further range of actions with different resource profiles, which may then be matched to the resource level after several iterations.

The model was the first to implement a holistic approach to regeneration strategy evaluation, evaluating not just the physical built environment but also the social, economic and environmental attributes of the targeted properties, to appraise and select the most suitable option, which would then be compared to the availability of economic resources using the principles of cost-benefit analysis to select the most suitable approach. The outcome was a set of options together with the associated cost profiles which could be implemented. In addition, the model also provided estimations based on the social, economic and environmental impact on the community associated with each option. Whilst the model would appear to meet the needs of housing practitioners, it has been sufficiently defined to be useful outside the Bolton Metropolitan Borough Council. In addition, the model does not specify in sufficient detail how the quantitative benefits are measured nor provide sufficient detail regarding the methodology employed for the option selection, since Bell fails to clarify if the choice of an option was to be based on the outcome of the resource requirement versus an availability assessment or the standards that could be achieved.

The ODPM (Office of the Deputy Prime Minister) commissioned the consultancy practice, DTZ Pieda, to develop a decision framework specifically for private housing regeneration projects in preparation for the implementation of the HMR (Housing Market Renewal) regeneration strategy. The research resulted in the Neighbourhood Renewal Assessment Manual (DOE, 1992; DTZ Pieda, 2004). The framework was primarily designed to assist local authorities and other stakeholders to undertake systematic evaluations of current housing as part of an overarching master planning process. The framework moves through ten principle phases of evaluation, as depicted

in Figure 2.10. Final decisions are made by giving either a monetary value or a point score to a range of physical, social, economic and environmental indicators.

Despite the framework being recommended to local authorities by the ODPM (2004), who assert that its robust approach will aid the user to make effective regeneration investment decisions, the model appears to place a strong emphasis on the societal impact of intervention on the area under assessment. This strong focus encourages local authorities to devise heavily socially focused strategies. Once the potential interventions have been defined, the various options are subjected to a modified form of life cycle cost analysis. Yet, critics of the first variant of the framework have suggested that the application of life cycle cost analysis weights the outcome in favour of refurbishment led intervention, with more radical approaches including full rehabilitation and clearance only being considered when the physical condition of the housing makes refurbishment un-economical due to structural failure (Leather and Mossley, 2002). Although the NRA (Neighbourhood Renewal Assessment) provides a clear process framework, within which decisions can be made, the framework stops far short of identifying the features of sustainability to be evaluated, nor does the model provide any clear guidance on how these features are to be identified, measured or weighted. Finally, the model further fails to identify how the relationship between sustainable benefits and the financial aspect of the project are to be synchronised. Instead, the guide favours leaving these decisions to the user.
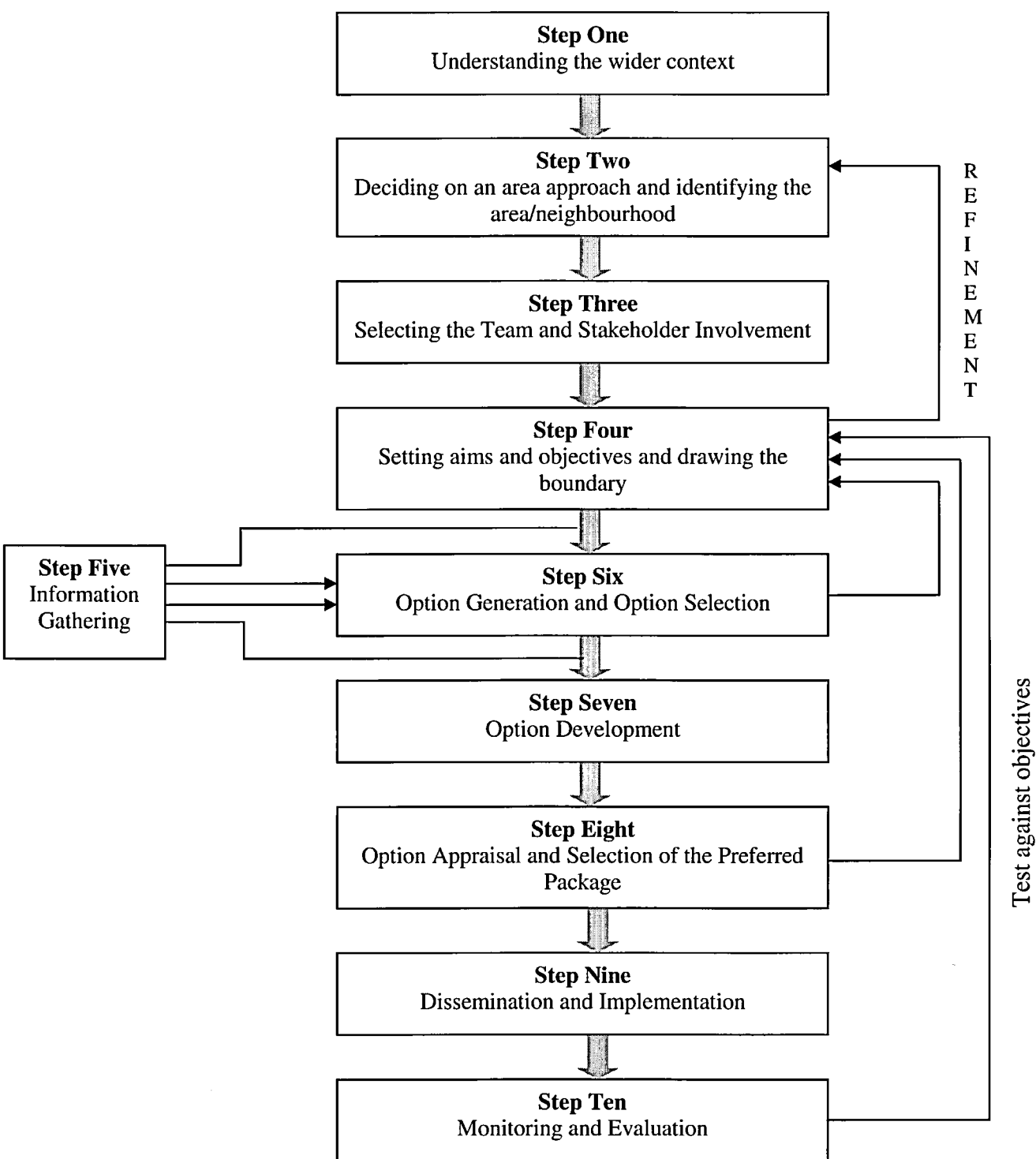
Figure 2.10: NRA Process Framework (ODPM, 2004)

In their work undertaken on behalf of the National Housing Federation, Treanor and Walker (2004) identify the competing pressures on social housing asset management teams. On the one hand, they need to consider the increasing financial pressures applied to social housing providers and ensure that all investment is commercially sustainable whilst, on the other hand, they are required to consider the four aspects of social policy

enforced on social housing providers, including sustainable neighbourhoods, decent homes, affordable housing supply and, finally, the national strategy for neighbourhood renewal. This, the authors argue, creates a situation similar to that identified at the William Sutton Trust, in which asset managers consider:

> ". . .for example, for a £10,000 full modernisation the 30 year NPV model with 6% discounted cash flow (DCF) calculates break even at year 16 assuming group average management and maintenance costs. Within the William Sutton Trust investment planning methodology, sustainability of 15 years is sought before a modernisation programme proceeds. The point at which this becomes critical is where stock condition surveys show the need for early year's investment, but break-even timescales cannot be predicted in terms of sustainability. It is therefore essential that housing associations make some assessment of the sustainability of their neighbourhoods" (Treanor and Walker, 2004:78).

In an attempt to provide guidance to asset management practitioners working in the social housing sector, Treanor and Walker (2004) attempted to refine Bell's work by developing a sustainable appraisal tool for use in such decision environments. As with Bell's earlier work, the framework took the form of a detailed flow chart, shown in Figure 2.11, which allowed the user to move through the principle phases and develop a sustainable appraisal to support the financial appraisal of the project.

Unlike Bell, Treanor and Walker (ibid) have provided extensive guidance in relation to how the model is to be applied. The initial phases of the model relate to the strategic direction of the overall asset management plan, in which any appraisal will be located. This includes identifying the scope and nature of the proposed intervention followed by an assessment of whether or not an appraisal of the project's sustainability will be critical to the decision and, if so, the extent of the appraisal needed.

In these initial stages, the authors appear to suggest that individual sustainability assessments should not be undertaken, and that the framework is concerned only with neighbourhood level evaluation; however, as Edum Fotwe and Price (2009) argue, sustainability assessment can and should be undertaken at multiple levels. Both Dempsey et al (2009) and Turcu (2013) further reinforce this view. In their reviews of sustainable development from a housing social policy viewpoint, it is asserted that there is a notable difference between sustainability' at the 'urban' level and sustainability at the 'building' or project level. Typically, the former will be assessed at the community or neighbourhood level, whereas the latter will focus on the specific entity; however, any assessment will also consider the wider impacts of that project or building.

Moving to the application phases of the model, the authors advise on the selection of potential indicators. Despite acknowledging the importance of indicator selection, they proceed to identify in excess of 80 socio-economic indicators, which could be integrated into the project evaluation process for neighbourhood level appraisals. However, Treanor and Walker (2004) failed to provide clear guidance about which of the socio-economic variables listed would be critical to the final decision or the processes by which they could be evaluated. Once the user has selected the indicators, the framework moves forwards through data gathering into data scoring. Once again, the guidance at this point is relatively vague, with users recommended to consult the work of Long and Hutchins (2003) for potential data sources. However, comprehensive guidance is provided to the user regarding how the data can be scored and weighted. Based on the application of decision theory, the authors suggest the application of a decision matrix, which includes all of the potential asset interventions in the matrix.

Although advancing Bell's (1981) earlier research, the work failed to provide clear guidance in relation to the identification of socio-economic variables that would be critical to the final decision or the process whereby the housing association should evaluate and select potential variables. Such omissions left the user with the difficult task of deciding which social, economic and environmental aspects were the most relevant and which should be incorporated or be rejected. These limitations, taken together with the evident 'urban' or spatial focus of the framework, prevent the model's application by built environment professionals seeking to evaluate the sustainable benefits achievable through the implementation of specific asset investment strategies.

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                    ┌──────────────────────┐
          ─────────▶│  Asset Management    │◀──────── ◀──
                    │      Strategy        │
                    └──────────────────────┘
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                       ▼                  ▼
                  ┌─────────┐       ┌─────────┐
                  │   Yes   │       │   No    │ ─────────▶
                  └─────────┘       └─────────┘
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              │ Partial/Initial│──▶│ Full/detailed  │
              │  Assessment   │    │  assessment    │
              └───────────────┘    └───────────────┘
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                     │   Setting Trigger    │
                     │   Indicators and     │
                     │     Benchmarks       │
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                     │  Option Delivery and │
                     │      Monitoring      │
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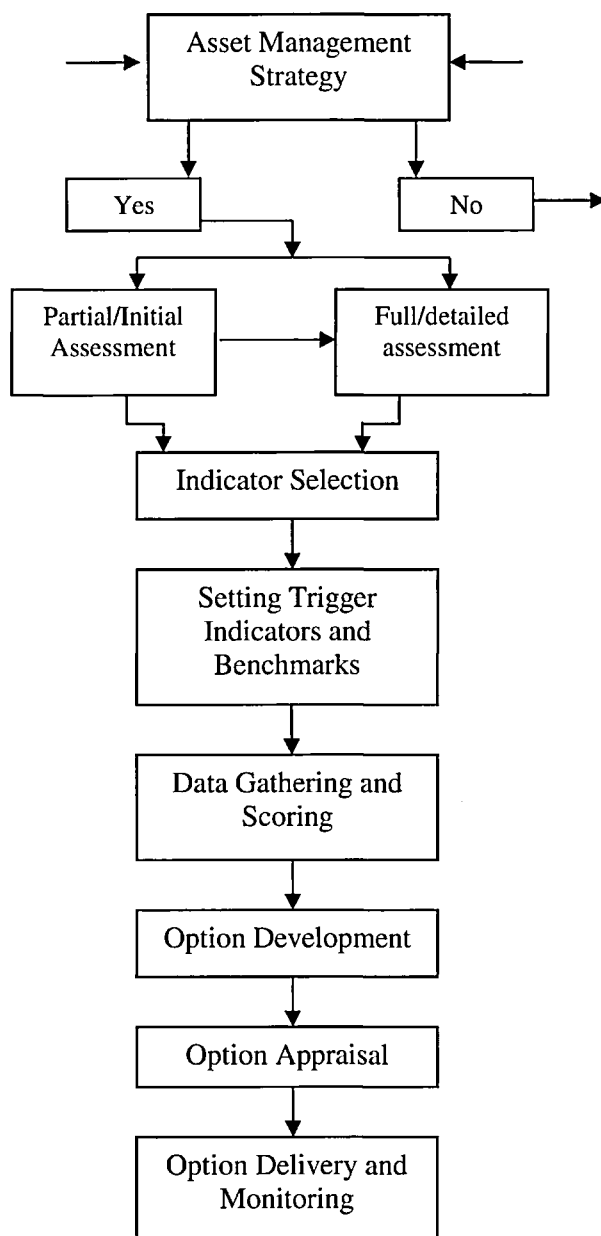
Figure 2.11: Neighbourhood Sustainability Appraisal Tool (Treanor and Walker, 2004)

Teo and Lin (2010, 2011), at the National University of Singapore, sought to develop a decision tool to aid property managers to plan investment related to the refurbishment and adaption of the existing stock within the limited budget parameters allowed. To achieve the desired level of objectivity, the researcher applied the multi-attribute utility technique within the tool, enabling the application of importance weightings to pre-determined attributes in order to devise suitable weightings. In the model, each of the attributes is given a specific value by the stakeholder for each level of improvement. Yet, the conceptual framework has been designed specifically with adaption in mind. As such, the potential outcomes of the decision have been restricted to retaining the asset, undertaking some form of renovation or, finally, demolishing the existing

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dwelling and redeveloping the site. When the weightings within the tool are applied to these preferences, the outcome will be a score indicating the most suitable and therefore recommended course of action.

Whilst the model proposed develops the earlier work of Needleman and others, since the researchers have attempted to consider the social, economic and environmental attributes of the decision again in an objective manner. The variables addressed appear to be restricted to the physical property, subsequently preventing a full appraisal of the range of environmental and social variables which would influence this decision if the primary and secondary stakeholder benefits are to be considered, as is the case in the UK social housing sector.

2.4   Summary of Findings

The literature review has considered the three main themes evident in the literature related to the research questions, thus providing the contextual background to this thesis. The literature review has mapped out the current position in terms of sustainability and sustainable development, together with some consideration of the various toolkits and assessment methods presently available for the appraisal of sustainability at project level. The literature review reveals the existence of both a systematic bias towards the environmental dimension of sustainability together with the rather lacklustre approach that the construction and property professions appear to have developed towards the attainment of sustainability at the programme and project levels. Further sections of the literature review explored aspects of asset management, and the social pressures facing the UK social housing stock. They reveal the pressures that housing practitioners are facing through the interplay of social phenomena contributing to an under-demand for some property and the social exclusion of some communities on the so-called sink estates. Finally, the literature review evaluates the current approaches to the investment evaluation, revealing the dominance of financial appraisal strategies such as internal rate of return and net present value. However, this section also evidences seminal research that calls for a paradigm shift in approach towards investment appraisal models, which consider community benefit in addition to financial performance. The literature reviewed indicates that this call has yet to be fully answered, charting the ever increasing development of new models and toolkits which aim to help professionals to provide more holistic early stage evaluations of potential

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projects which inform stakeholders of the sustainability of their business decisions. The lack of consensus on the variables to be measured together with the many conflicts between the models proposed, in terms of both their detail and the nature of their overarching features, suggest that further investigation is needed to confirm the overarching features of sustainability that should be considered by Private Social Housing Providers in the evaluation of sustainable projects. This then sets the research question in context; evidencing the need for further work to build on this call for a paradigm shift in investment appraisal approach, which links the increasing importance of sustainability and the socio-economic pressures faced by the social housing sector to the monetary based evaluation of stock investment strategy.

Chapter 3   Research Methodology

3.1   Introduction

At the outset of any research project, it is important for researchers to articulate fully their research strategy, within which every facet of the study should be established, identifying the underlying ontological and epistemological position adopted (Fellows, 2010) through to detailed explanations pertaining to the data collection and analysis strategies. The research design for this study is based on the structure proposed by Crotty (1998), who asserts that researchers need to answer three fundamental questions:

- What epistemology informs the research and lies behind the methodology in question?
- What methodology or strategy linking methods to outcomes governs our choice and use of methods?
- What research procedures and techniques are to be used?

These three questions demonstrate the interrelated levels of decision making required when designing research. Moreover, they inform a choice of approach, ranging from the broad assumptions brought to the project down to more practical decisions about how to collect and analyse the data (Creswell, 2013), although Dainty (2008) asserts that the latter is impossible if researchers have not first identified and defined their philosophical position, given that this will significantly affect the manner in which the data are collected and analysed and so, ultimately, the nature of the knowledge produced. As such, the first section of this chapter is devoted to articulating the philosophical position and orientation of the research.

3.2   Philosophical Background

The fundamental question confronting anyone undertaking social research is the need to construct a philosophical position and orientation towards the enquiry (Dainty, 2008). In doing so the researcher must decide on a paradigm or "*worldview, complete with assumptions that are associated with that view*" (Mertens, 2003:139) that is appropriate to the research to be undertaken (Guba, 1990).

Dainty (2008) suggests that the selection of a philosophical paradigm should consist of three essentials:

1.	Ontology	What is the nature of reality?
2.	Epistemology	How do we know the world?
3.	Methodology	How do we gain knowledge of the world?

The above suggests that the selection of ontology (assumptions about how the world is made up and the nature of things) and epistemology (our beliefs about how one may discover knowledge) should be selected in sequence but Crotty (1998) avows that they should be considered together, as they are interdependent, whereas Bryman (2004) suggests that the philosophical "paradigm" is a cluster of beliefs and diktats, so it can be argued that the paradigm is a mix of *how* and *why*, both of which influence what should be studied and the approach used. Creswell (2013), meanwhile, asserts that the literature uses various terms for one key premise: the nature of knowledge, yet Dainty (2008) argues that construction management does not yet have a clear theoretical or philosophical base on which researchers can develop their design. Instead, the discipline is torn between social and natural science (Love *et al*, 2002). This, Dainty (2008) attests, leaves the researcher with the difficulty of deciphering the many conflicting theories of knowledge and paradigms within the literature from which the research can be potentially developed. This section articulates and fully justifies the research strategy, methodology and data collection processes used in the study.

3.2.1 Ontological Prospective.

Ontology is employed as the accepted concept for dealing with the nature of reality (Creswell, 2007). As such, it raises issues related to researchers' views of reality (Dainty, 2008) and their assumptions about the way in which the world operates, although the literature appears to disagree on the number of ontological positions available. Dainty (ibid), for instance, identifies the ontologies of objectivist and constructivism whereas Crotty (1998) opines there are actually three ontological positions, adding subjectivism to the list. Finally, Hepburn (2003) attests that, for research in the social sciences, realism and relativism represent the main ontological focus. Although he further suggests that researchers need to examine the accepted

ontological conventions of their discipline when deciding on how reality is to be interpreted.

In Construction Management (CM) research, it is widely acknowledged that the accepted theoretical root of this discipline is in an objective, realist ontology that sees social phenomena and their means as existing independently of social actors (Dainty, 2008). As such, CM research, through its scientific base, aims to uncover these rules so that we can understand and, through our theories, describe the objective reality that exists interdependently of ourselves, regardless of whether or not society recognises and acknowledges its existence (Crotty, 1998; Runeson and Skitmore, 2008).

Despite providing a brief overview of the ontological position adopted in CM research, this thesis is developed from a pragmatic prospective because, as Greenwood and Levin (2005:23) attest, the real world *"does not issue problems in neat disciplinary packages"* to which certain philosophical perspectives can be neatly applied. Pragmatism adopts a holistic view grounded in the realities of practice, whereby the researcher moves between epistemologies in a way that enables the selection of the most appropriate research tools to allow solutions to be identified, thus making it impossible to locate the work within any one ontological view of reality.

3.2.2 Epistemological Perspective

Epistemology is concerned with the principles of knowledge (Knight and Turnbull, 2008). It therefore raises issues around what can be regarded as acceptable knowledge within the researcher's own discipline (Dainty, 2008), resulting in a highly varied range of epistemological perspectives which have grown and developed from and because of each other over many centuries (Knight and Turnbull, 2008). Yet, Creswell (2013) suggests that it is important for researchers to define their epistemological perspective, as this defined standpoint will impose certain assumptions about how and what researchers will learn during the study. These assumptions will certainly influence the methodological design whilst also eventually influencing the contribution to knowledge. As each epistemology generates different kinds of knowledge about the industry (Dainty, 2008) and, importantly, provides a set of criteria against which this contribution can be judged, it is therefore important to identify how epistemological theory has evolved within the discipline of CM research, whilst also evaluating the

dominant epistemological theories evident in the wider social sciences. To this end, Creswell (2013) identifies four main epistemological perspectives available to researchers, including: Post Positivism; Constructivism; Advocacy/Participatory and, finally, Pragmatism, although each will contain many variants, as epistemologies are adapted and evolved.

3.3.1 Epistemological development in Construction Management

With regard to CM research, Seymour and Rooke (1995) rebuked the dominance of the post-positivist epistemology, arguing that epistemologies associated with the natural sciences have no place in the field of management research which should instead, they argued, be associated with the study of sociological phenomena and subjective human experience. Given this proposition Seymour and Rooke (1995) opined that construction researchers should adopt an interpretative research approach. Indeed Seymour *et al* (1997) later validated this argument, suggesting that CM research is essentially at odds with the realities of science for two important reasons: firstly, it is concerned with meaning not causality and, secondly, CM researchers are required to make value laden judgements. Despite acknowledging that a significant body of CM research is merely a testament to the researchers' ability to apply statistical analysis or, at best, a deviance away from positivist research rather than a demonstrable commitment to systematic, principled and empirical positivist research, Runeson (1997) nonetheless advocated the use of the traditional positivist approach within CM research, opining this to be the best safeguard against poor research, whilst also enabling researchers actively to test for causality, which Runeson (1997) argues is essential for the creation, development and testing of new theory.

Loosemore *et al* (1996) conducted a survey of publications in the referred journal, Construction Management and Economics, which reaffirmed the dominance of the scientific approach, as 57% of all papers adopted a quantitative approach, whereas only 8% adopted a qualitative approach and 13% a pluralist methodology. The remaining 22% of the papers published were classified as 'non-research' due to their lack of empirical data. These results where further supported by Carter and Fortune (2004), who reapplied Loosemore *et al*'s methodology to 100 papers published in the 2000 and 2001 proceedings of the Annual ARCOM (Association of Researchers in Construction

Management) Conference, the proceedings of the Heriot Watt University postgraduate conference from 2001 to 2003 and, finally, 100 papers published in the Journal of Construction Management and Economics between 1983 and 1993. They once again reported that 45-73% of the published papers used a positivist epistemology. Finally, Dainty (2008) undertook a further review of 107 CM research papers published in volume 24 (2006) of *Construction Management and Economics*. Of these, Dainty observed that 76 used quantitative methods, 16 qualitative methods and 12 adopted a pluralist design, combining inductive and deductive research. Of the 16 papers that employed qualitative methods, Dainty (2008) further observed that over 75% used interviews, with the others adopting focus groups, observation or document analysis. From the analysis, which incidentally adopted a positivist derived approach, Dainty (2008) concluded that, contra to the calls for changes in methodology from the mid-1990s, CM researchers have continued to favour objectified or quantitative methods, an argument that was reinforced by both Loosemore *et al* (1996) and Carter and Fortune (2004). Yet, whilst Dainty stopped short of declaring that the discipline still used positivist and natural science approaches, he did suggest:

> "It is highly likely that this reflects an on-going adherence to natural
> science methodologies and reductionist approaches to social enquiry
> within the community" Dainty, (2008:7).

Dainty (2008) was also critical of the use of qualitative methods within the CM research community, whilst this clearly indicates a move towards the ideals debated in the mid-1990s, the dominance of the rationalist paradigm as, Dainty asserts, this prevented these researchers from implementing truly qualitative research. Instead, CM researchers have thus far failed to close their studies with the tradition of reflexivity observed in the social sciences, whereby the researcher openly questions the effectiveness of their research methods based on the robustness of their results and further debates the influence and effect of their enquiry on the phenomena that they sought to observe.

Yet, Fellows (2010) contests Dainty's findings, asserting that the debate in the early to mid-1990s has been responsible for a paradigm shift in CM research away from the traditions of Newtonian reductionism towards a far more constructivist paradigm. In addition, he argues, the debate triggered renewed interest in the use of interpretivism, with the use of epistemologies such as grounded theory and ethno-methodology increasing in frequency, although publishing the results of such research remains a challenge due to the robust justifications required.

3.3.2   Positivist Epistemology

The objectivist ontology sees social phenomena and their means as existing independently of social actors (Dainty, 2008). These phenomena are governed by a set of rules that stipulate the way in which variables interrelate. Science aims to uncover these rules so that we can understand and describe, through our theories, an objective reality that exists interdependently of ourselves (Runeson and Skitmore, 2008). As such, the epistemology of positivism and its underlying objectivist ontology suggest that objects exist regardless of whether or not society recognises and acknowledges their existence (Crutty, 1998). Therefore, positivists argue that knowledge is introduced into the mind, from the external environment.

Seen through the objectivist lens, research is a deductive process, whereby theory is tested using empirical data in an attempt to understand the realities of the world. As the positivist epistemology asserts that only the statements validated or rejected by experience can have cognitive meaning, they emphasize the use of science and numbers (Gill and Johnson, 2002). In applying this position, positivists avow that the social world can be studied in the same way as the natural world, through a value free deductive or theory led approach with explanations of causality applied. Yet, critics such as Denzin and Yvonna (1994) and later Mertens (2009) question the adoption of such a value free view of knowledge within the social sciences, arguing that rationality and positivism ignore important value laden characteristics such as loyalty, tradition and image that can compete with rationality and decide human behaviour.

In relation to the reported research, which aims to create a tool for aiding senior practitioners objectively to justify their judgements relating to the most appropriate course of action within the investment environment, the use of the positivist epistemology makes sense. Yet, Feenberg (2010) argues that a key weakness within the existing largely economic tools, such as cost-benefit analysis, is their strong association with this epistemology, which he purports have thus far prevented truly sustainable decisions from being achieved mainly due to the inability of economics to translate subjective judgements into objective monetary values (Brandon and Lombardi, 2011:102), resulting in asset management decisions being driven by the assessment of financial merit alone.

Indeed, when the mechanics of cost benefit analysis are explored, it is noticeable that trade off theory, which is depicted in the economics and science generally through the

medium of *ceteris paribus*, heavily influences the tool. Through the assumption of *ceteris paribus*, scientists theorise that all other things remain equal. As such, attributes within the decision process can be traded off against each other, on the assumption that all other variables remain the same. Whilst some decision theorists, including Saaty (2001), argue that this process is an essential part of decision making, it is this epistemological focus together with adoption of trade off theory that, Feenberg (ibid) argues, hinders the effective evaluation of both the environmental and social dimensions of sustainability within the decision process, given that both dimensions are heavily reliant on the appraisal of factors drawn from the subjective values judgements of humans (Brandon and Lombardi, 2011:21).

3.3.3 Constructivist Epistemology

Growing out of Edmund Husserl's phenomenology and the later German studies of interpretive understanding termed *Hermeneutics*, constructivism infers that social phenomena are produced through social interaction and are therefore in a constant state of revision (Dainty, 2008). This continuous social interaction leads eventually to the construction of social phenomenon based on perceptions of reality (Robson, 2002). As such, there is no objective truth waiting for us to discover; instead, truth, or rather meaning, comes into existence through our engagement with the realities of our world. Yet, as there is no meaning without a mind, meaning is therefore not discovered but constructed (Crutty, 1998). According to Hor (2001), knowledge does not simply explain the truth of the world; it is the legitimisation of personal experience. Kue (1996) suggested that the contribution of constructivists was to avoid the conflict between objectivism and subjectivism. They attempted to construct a model of equal interaction between human beings and nature, and reflect active and passive complementary characteristics between humans and nature.

On this basis, Creswell (2013) opines that the principle aim of this epistemology is the study of subjective meaning, with the researcher actively seeking to interpret how individuals understand and experience the world before applying subjective meanings to these experiences. Consequently, the constructivist epistemology seeks to evaluate the subjective perceptions, emotions and reflective interpretations that the research

participants attach to certain phenomena (Jacob, 1987), with the researcher subsequently attempting to understand the problem from these accounts.

The adoption of a constructivist approach to the study would have allowed the various participants to express how they perceive the issues associated with the various dimensions of sustainability (the phenomena). These various perceptions of experience could then collectively influence the overall business case for the organisation. This perspective is aligned with that of Pinch *et al,* (1989), who opine that the many options available within the decision environment and, more specifically, the choice between them will be influenced by a myriad of social and political actors. Yet, whilst a constructivist approach has been implemented for part of this study, it would have prevented the researcher from carrying out the various deductive aspects of the research design needed to generate the final conceptual framework. As such, the objectivist suggestion that decisions are a simple matter of efficiency must be discounted.

3.3.4   Interpretivist Epistemology

The interpretivist epistemology holds that social phenomena are created from the perceptions and consequent actions of social actors, with meaning imported from our existing knowledge and an awareness of similar processes or phenomenon (Crotty, 1998). Interpretivism therefore purports that knowledge is what we perceive to be real, with no independent, underlying, true reality existing beyond human perception. In adopting this interpretive view, Crotty (1998) avows that researchers must fundamentally accept that meaning is developed from anything apart from the interaction between the subject and the object. In contrast, the key premise of this research is that the phenomenon of sustainability exists beyond the individual experience of those working in social housing. Indeed, the research reported actively sought to appraise how social housing professionals engage and interact with the underlying phenomenon of sustainability.

3.3.5   Pragmatic Paradigm

Pragmatism has its roots in the work of the American philosopher, Charles Peirce, who first proposed the *pragmatic maxim*, a philosophy which was then subjected to further

advancement in the seminal works of William James and John Dewey (Talisse and Aikin, 2008). At the core of this early view of pragmatism was the rejection of the scientific belief that social enquiry could access the truth about the real world solely by virtue of a single scientific method (Mertens, 2009). Despite its increasing adoption in the US, the philosophy temporally fell out of favour after World War II.

Richard Rorty and Willard Van Orman Quine are largely attributed with the revival of the philosophy through their reinterpretation of the original thinking (Neo-pragmatism) which allowed the philosophy to become aligned with the linguistic turn in 20th century philosophy resulting in a stronger emphasis being placed on language in addition to action (Hammond and Wellington, 2013).

Despite the shift towards language and action, neo-pragmatism retained the key features of the *pragmatic maxim*, with pragmatists continuing to assert that, in order to know the meaning of a concept, researchers need to consider its practical consequences rather than adhere to preconceived, theoretical ideas. It is this general thread which runs through the pragmatists' claim to knowledge, preventing any particular ontological and therefore epistemological prospective, with pragmatists articulating the belief that the problem is sovereign not the methods used to understand the problem (Creswell, 2013).

The justification for the adoption of pragmatism comes in part from Greenwood and Levin's (2005) views on reform within universities, together with earlier work of Waddock and Spangler (2000), who identified a major problem with the production of knowledge which they aligned with the 'Humpty Dumpty' nursery rhyme, opining that, if researchers are to be effective, they must see the problem holistically, through lenses that are capable of simultaneously integrating multiple perspectives. This, Greenwood and Levin (2005:23) argue, is the crux of the real world; because the real world *"does not issue problems in neat disciplinary packages"* to which certain epistemologies can be neatly applied. Rather, researchers must move between epistemologies, in a way that enables the required research tools to be applied to the problem in order to identify a potential solution to it.

For this research, a multi-disciplinary approach was required, which takes methodologies from both the social and natural sciences, to allow the social phenomenon to be identified before being moved into a construction context. The adoption of a pragmatic paradigm makes this possible, whilst the adoption of the research design runs contra to the methodological debates within the construction

management literature, supported by influential scholars such as Runeson (1997) who openly expressed his concern about the adoption of increasingly pragmatic research founded on methodologically pluralist designs in an arguably rationalist or positivist discipline. Yet, as Fellows (2010) attests, this shift in the philosophical lens adopted by CM researchers can result in outcomes which are more reflective of the realities of the world that we occupy and study. In any case, the vast variation of approaches to asset management exhibited in both the UK and Dutch social housing sectors, identified in the works of Albanese (2007), Gruis (2008), Gibb and Trebeck (2009) and Neiboer and Gruis (2014), which are influenced by political, social and market pressures, prevented the adoption of a post-positivist research design whilst, as discussed in detail earlier, the adoption of either an interpretive or constructivist design would not generate the type of data required to answer the research questions. Therefore, a pragmatic, methodologically pluralist research design approach has been adopted.

3.4   Conceptual Framework

The thesis is guided by a conceptual framework grounded in the application of systems thinking. Systems thinking represents a holistic approach to overcoming complex problems such as sustainability. The complexity of sustainability is obvious. As chapter 2 evidences, sustainability is often defined as cutting across both synthetic and natural systems from a local, regional, national and potentially international perspective whilst also spanning both time and distance (Moir and Carter, 2012). Hence, every action can contribute to or detract from the goal of sustainability. As identified in the literature review, a theoretical view of sustainability, derived from a systems thinking base, can be effectively used to model the concept of sustainability and, in turn, the human activity that takes place within this model. This is useful in trying to link project evaluation practices in a meaningful way to the vast concept of sustainability.

Systems thinking is derived from a view that the world can be seen as a complex series of interconnecting elements that form a whole (Checkland, 1981), and provides an ideal methodological approach for understanding how things work, as it involves looking not only at the problem in its entirety but also at the connections between various aspects of it. Accordingly a systems approach avoids the need for reductionism, instead viewing

the world in a holistic manner (Checkland, 1981), leading to its wide scale adoption of disciplines, ranging from computer programming to social science.

Reviewing the development of general systems theory, Boulding (1956:102) suggested that systems theorists did not seek to develop a *single general theory*. As such, a theory would be almost without content, as *"all we can say about practicality everything is almost nothing"*. Instead it was necessary to create understanding at a level that has meaning to those interested in understanding a system. Responding to this need, Boulding (1956) proposed a hierarchy of systems, shown in Table 3.1, to assist the user to develop a whole world view of systems.

	Level	Characteristics	Examples
1	Structures, Frameworks	Static	Crystal, structures, bridges
2	Clock-works	Predetermined motion (may exhibit equilibrium)	Clocks, Machines
3	Control Mechanisms	Closed loop control	Thermostats
4	Open systems	Structurally self-managing	Flames, Biological cells
5	Lower Organisms	Organised whole with functional parts 'blueprinted' growth, reproduction	Plants
6	Animals	A brain to guide total behaviour, ability to learn	Birds and Beasts
7	Man	Self-consciousness, knowledge, symbolic language	Human beings
8	Socio-cultural systems	Roles, communication, transmission of values	Families, the boy scouts, drinking clubs, nations
9	Transcendental systems	Inescapable unknowable's	The idea of God

Notes:
  (1) Emergent properties are assumed to arise at each defined level
  (2) From level 1 to level 9, the complexity increases; it is more difficult from an outside observer to predict behaviour; there is increasing dependence on un-programmed decisions
  (3) Lower level systems are found in higher level systems e.g. man exhibits all the distinguishing prosperities of level 1-5 and emergent properties at the new level.

Table 3.1: Boulding's (1956) Hierarchy of systems

Each level of the hierarchy has emergent properties that define a system's characteristics, increasing in complexity as one moves up. Therefore, a new emergent property is required to specify a higher level of complexity with lower level systems located towards the top of the hierarchy. However, Checkland (1981) asserts that, by adopting a reductionist approach, the hierarchy's use of the above the systems identified

at the lower levels is significantly limited due to Boulding's (1956) failure to provide an adequate account of system complexity at the higher levels of the hierarchy.

Publishing in *Themes in Speculative Psychology*, Jordan (1968) sought to build on Boulding's earlier work by proposing a non-hierarchical, systems' taxonomy. Consisting of three basic organising principles, the taxonomy enabled an observer to define a system as an *interaction between what is out there and how we organise it in here*. The first principle is the *rate of change*. Something that does not change within a specific time span is deemed to be a structural or static system whereas something that changes is defined as a functional or dynamic system. The next principle is *purpose*; here, Jordan identifies two further systems, purposive and non-purposive, as defined by throughput. A purposive system has an input which is internally processed and transformed into an output, while a non-purposive system is defined as a physical system which, in equilibrium, provides an illustration (i.e. a volcano). Finally, the third principle is *connectivity*, which suggests that interventions into a system which lead to the removal of parts and the breaking of connections has two potential outcomes. If the system is mechanistic, the intervention will produce no change whereas, in an organismic system, the intervention will be significant.

Ultimately Jordan's taxonomy provides eight system groupings, each with three properties, which Jordan arranged in the sequence illustrated in Table 3.2.

Grouping	Properties	Example
1	Structural Purposive Mechanistic	A road network
2	Structural Purposive Organismic	A suspension bridge
3	Structural Non-purposive Mechanistic	A mountain range
4	Structural Non-purposive Organismic	A bubble (a physical system in equilibrium)
5	Functional Purposive Mechanistic	A production line (a breakdown in one machine does not affect other machines)
6	Functional Purposive Organismic	Living Organism
7	Functional Non-purposive Mechanistic	The changing flow of water as a result of a change in the river bed
8	Functional Non-purposive Organismic	The space/time continuum

Table 3.2: Jordan's systems taxonomy (Skyttner, 1996:120)

The weakest part of the taxonomy is the argument that a system is designed to be *purposive or non-purposive.* Here, Jordan (1968) asserts that a system either has purpose or it does not, but purpose in this regard is defined by the system rather than its user, designer or observer. This weakness in the work becomes apparent from the appraisal of music, as the dictionary definition of music is that it is, *inter alia,* a *system of sounds.* As such, Jordan (1968) asserted that music is a non-purposive, time-bound, functional system that would fit into the taxonomy at grouping 7. Yet, Skyttner (1996:120) argues, music has a clear purpose for both its composer and listeners. Consequently, Skyttner attests that the taxonomy's usefulness is restricted to its ability to distinguish between systems, rather than providing a framework for the resolution of problems.

Whilst the influential works of Boulding (1956) and Jordan (1968) attempted to describe the world in terms of empirical data and scientific methodology, Checkland (1981) opined that neither Boulding's (1956) hierarchy or Jordan's (1968) taxonomy provided sufficient guidance on how to address the higher levels of complexity associated with real-world problems. In an attempt to overcome this limitation,

Checkland (1981) proposed a typology for providing a framework for understanding human activity within a natural system setting. Within the typology, five classes of system are identified, including natural, human activity, designed physical, and designed abstract, all of which exist within a final transcendental system that is beyond knowledge.

The concept of this typology is based on an understanding that:

> "Any whole which an observer sees as a figure against the background of the rest of reality, may be described either as a system of one of these five classes or as a combination of systems selected from the five" (Checkland, 1981:111).

As a result, systems thinking may be described as the search for conditions governing the existence of emergent properties together with an understanding of the relationship between these emergent properties and the systems within which they exist, leading to an innate reliance on cause and effect relationships. Its use should therefore make the interpretation of complex reality more achievable.

Skyttner (1996:38) further suggests that all systems can be considered as being either closed or open, whereby closed systems are capable of self-sufficiency, comprising of a fixed set of components or entities, such as the biosphere, whereas open systems are dynamic, relying on an exchange of matter, energy and information with the environment in which they exist. In addition, they may be defined as fixed, periodic, chaotic or on the edge of chaos (Clayton and Radcliffe, 1996). Ecosystems and social systems are both examples of open systems, exhibiting such complexity and structure that they are classed as being on the edge of chaos.

Systems thinking can also be divided into two fundamental approaches: hard and soft systems thinking (Rosenhead and Mingers, 2001). Hard systems thinking, developed in the engineering discipline, can be regarded as a 'goal-directed' methodology, so a project, for example, can be defined and a systems analysis implemented to ensure that the project finds a perfect solution. However, this approach has proven inadequate when the complexities of the real world are encountered. As a result of this shortcoming, a set of 'problem structuring methods' evolved amidst a heated debate within the Operational Research community (Rosenhead and Mingers, 2001:2). This debate resembles the methodological debate in the CM research, with a number of theorists resistant to the theoretical shift that was emerging. The debate, however,

focused on the rejection of the assertion that the technical emphasis of the scientific or hard approach to systems thinking was a limiting factor (Ackoff, 1981).

One of the methodologies to emerge from this theoretical debate was the soft systems methodology (SSM), developed by Checkland in 1975. Checkland asserted that the application of a 'hard' systems approach to deal with soft problems, such as those encountered in the field of management, later defined as human activity systems (Checkland, 1981), was inadequate. To overcome such limitations, Checkland proposed a new systems' methodology designed to deal with the ill-structured problems encountered in the real world. This methodology reinforced the view that the 'problem', although recognisable, cannot be easily defined because human activity systems consist of a wide range of entities, and are subject to such numerous influences that time serves to modify the problem. As a result, the perception of the problem is subjective within a constantly shifting environment.

The soft systems methodology described by Checkland as 'systems thinking' presents a framework within which purposeful activity takes place. The methodology as originally proposed by Checkland consisted of seven stages, some of which were conducted in the real world, whilst others were conceptual and theoretical. However, critics of the methodology argued that these seven stages were overly prescriptive, resulting in difficulties related to aligning the methodology with practice. In an attempt to overcome the weaknesses within the methodology, Checkland and Scholes (1990) published a series of revisions to facilitate an increasingly flexible approach which allows the cultural context of the problem situation to be integrated into the process. Further, the stages identified in the revised methodology shown in figure 3.1, although designed chronologically, were intended to be part of a flexible, iterative approach to purposeful activity.
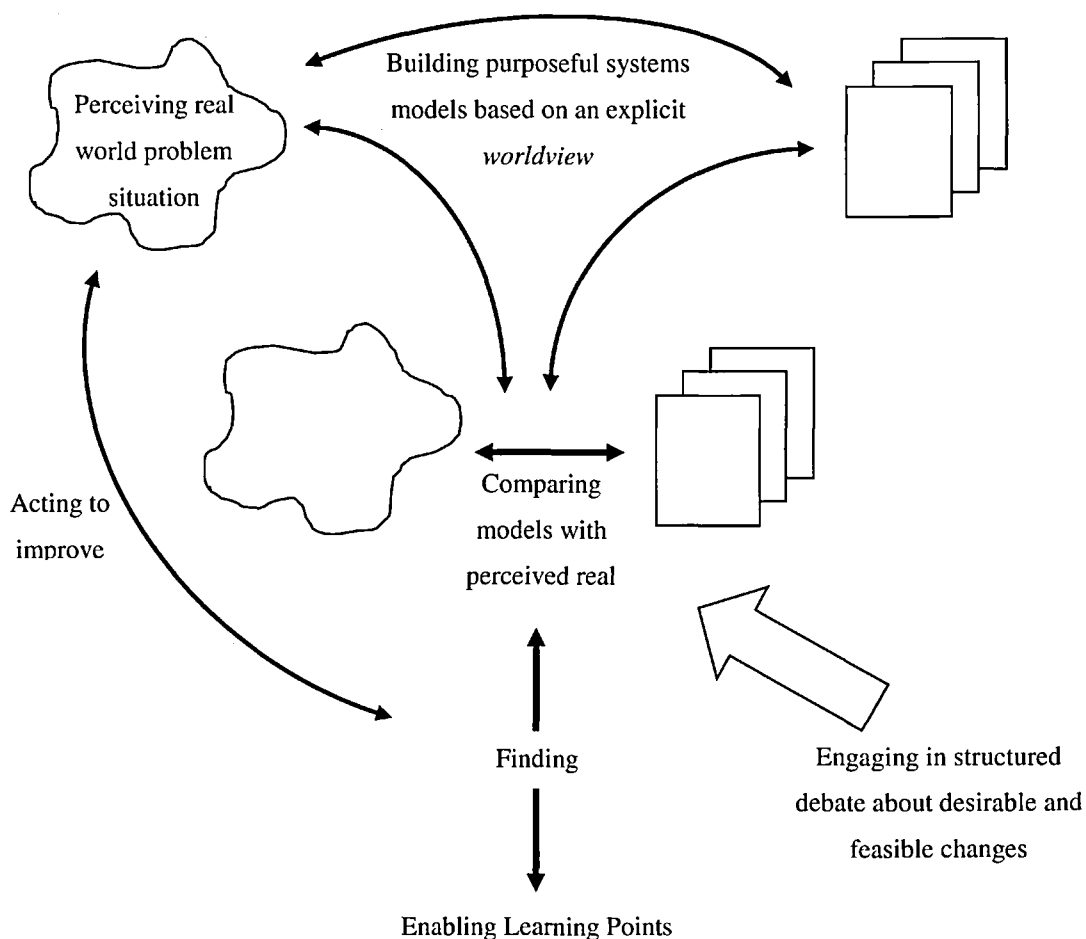
Figure 3.1: Checkland's five stage methodology (Checkland, 1999)

These revisions resulted in a far more holistic approach which can consider the wider worldview. At the core of this methodology lies the comparison of conceptual models and real world phenomena, whereby a model of the complexity encountered in the real world is constructed which can be subsequently tested against real world situations to establish feasible and desirable change. For this reason, the methodology was adopted as the guiding framework through which the research reported in this thesis was conducted.

3.5 Methodology

Researchers have long debated the relative value of qualitative and quantitative inquiry (Patton, 1990). Qualitative research uses a naturalistic approach that seeks to understand phenomena in context-specific settings whereas quantitative research uses

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deductive methods to test hypothetical generalisations. Each represents a fundamentally different inquiry paradigm, with research actions based on the underpinning philosophical assumptions. As pragmatists do not see the world as an absolute unity, the pragmatic paradigm provides a strong philosophical underpinning for the design of pluralist research strategies (Teddie and Tashakkari, 2008). Researchers working within this paradigm will seek to apply a variety of methodologies for the collection and analysis of data rather than subscribing to one inquiry paradigm (Mertens, 2009). Thus, in pluralist designs, investigators use both quantitative and qualitative data as they work to provide the best understanding of a research problem (Johnson and Onwuegbuzie, 2004; Teddie and Tashakkari, 2008; Creswell, 2013). Johnson and Christensen (2004) identify two dominant approaches to pluralistic research; the first is a multi-method, multi-phase design, in which the researcher uses one paradigm for one phase before changing to another for a further phase. The second approach is based on a mixed method approach, in which the researcher mixes both qualitative and quantitative approaches within a single phase of the research design. In designing the research approach for this study, it was clear that multiple disparate strands of activity were needed, drawing on both of the pluralistic research approaches identified by Johnson and Christensen (2004).

The first phase of the data collection was undertaken in an environment in which the researcher was unsure of the parameters of the research problem. In such situations, writers including Oppenheim (1992); Fellows and Liu (2008); Farrell (2011) and Creswell (2013) suggest that the research problem should be conceptualised to ensure that it is both researchable and relevant to academia and practice. To allow the research problem to be adequately conceptualised, Oppenheim (1992) advocates the adoption of qualitative data collection processes. Creswell (2013:22) further concurs with Oppenheim in this regard, suggesting that a qualitative methodology is essential when the researcher is not fully aware of the variables essential to the problem.

To collect such data, Creswell (2013:186) identifies four dominant approaches including observation, interview, document analysis and, finally, visual. Given the objectives of the initial stage of the research, some of the data collection techniques identified by Creswell were deemed unsuitable. For instance, Rose (2007) argues that visual methodologies aim to appraise how society interacts with images and how these images can influence culture. Clearly, such an approach would be unsuitable, as this phase of the research design sought to understand sustainable project appraisal in

practice. With this in mind, both Rubin and Rubin (2005) and Creswell (2013) suggest that interviews will facilitate the data collection, allowing sufficient depth to enable researchers to draw both meanings and ideas from the participants, and thus clearly meeting the needs of the researcher in this context.

Despite the benefits of adopting a qualitative approach to the conceptualisation of the problem, together with the increasing acceptance of qualitative research methodologies within construction management research (Carter and Fortune, 2004), Richards and Richards (1994) outline four major constraints which often discourage researchers from adopting the qualitative research process. These are the volume of data, the complexity of the analysis, the details or classification records, and the flexibility and momentum of the analysis. These limitations, together with concerns about the sample size attainable, suggest that the adoption of qualitative research alone would prevent researchers from fully mapping the state of the art in terms of sustainable project appraisal, which is a key objective of the study.

To minimise the effects of these limitations, a second phase of activity was undertaken, based on the conceptualisation of the research problem. To ensure that the state of the art was adequately mapped, the findings from the interviews were validated using a wider, more representative sample. To generate and survey a sufficiently representative sample, within the time and financial restraints of the researcher, Walliman (2011) encourages the use of the quantitative method, as quantitative research is regarded as being concerned with considerations of size and magnitude (Holt, 1998). Having emerged from the positivist branch of philosophy, quantitative research follows a systematic process in order to gather, measure and quantify numerical data (Cormack, 2002), through the use of data collection methods such as questionnaires, documents and observations (Parahoo, 2006), whereby inquiry into social and human problems is based on testing hypothesis or theory composed of variables, measured with numbers and analysed using statistical procedures to determine whether the hypothesis or theory holds true (Naoum, 2012). The limitations of quantitative research, including the inability to measure the deep underlying meanings and explanations such as motivating factors or views, together with the tendency to measure 'snapshots' of a situation, have been well documented by Amaratunga *et al* (2002) and further reinforced by Craig (2007). However, these limitations have been overcome through the multi-method design adopted over phases one and two. As Chen (1997) attests, because each method has its own strengths and weaknesses, combining methods provides the best results.

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Within this study, the difficulties associated with gathering snapshots of practice, together with concerns about a lack of depth have been overcome through the use of exploratory interviews to conceptualise the problem and enhance the initial literature review by confirming the key variables, which were then integrated into the questionnaire and confirmed by wider practice.

The third phase of the research design related to the development of a decision framework for the appraisal of alterative project strategies. In designing this phase, the researcher was mindful of Albanese's (2007) assertion that social housing asset management and investment evaluation practices are incongruent. The majority of organisations have developed their own in-house toolkits due to the significant variances in stock condition, market dynamics and other commercial pressures (Gruis *et al*, 2003; Albanese, 2007; Morrison, 2013), suggesting that a purely quantitative research strategy, where the objective is generality or population wide observation (Fellows and Liu, 2008; Leishman, 2008) was impractical. Yet, a purely qualitative approach, utilising subjective methods based on personal opinions, perceptions or feelings (Holt, 1998), such as ethnography, grounded theory, narrative or phenomenological research (Creswell, 2013), would have prevented the researcher from developing the decision tool required to meet the research aim. The research design therefore needed to facilitate a mixed methods approach that was capable of achieving the exploratory and explanatory aim, whilst also ensuring that it was usable given the social housing sector's incongruent approach to asset investment. This analysis and critical evaluation of the research design options suggested that the research had ultimately to be context driven (Proverbs and Gameson, 2008).

Fellows and Liu (2008) opine that both action and case study research are context driven and therefore suitable for the study. Bryman (2004) defines action research as an approach in which the researcher and an organisation collaborate to diagnose a problem and develop a solution based on this diagnosis. The researcher will therefore need to implement various actions in an attempt to solve a real world problem (Gummesson, 2000) and ultimately improve or modify the practices within the organisation (Elliott, 2001). Unfortunately, the inability of the case study organisation to commit to the implementation of the findings prevented the researcher from adopting this approach.

Yin (2014:24) defines case study research as "*an empirical inquiry that: investigates a contemporary phenomenon within its real life context, especially when the boundaries*

between phenomenon and context are not clearly evident" and identifies several points within this definition that typify case study research. First, a case study is involved with empirical inquiry and therefore relies on the collection of evidence to determine what is happening. Case studies focus on a phenomenon in context, typically in situations where the boundary between the phenomenon and its context is unclear. It is therefore useful for this type of study to ask a how or why question about a contemporary set of events over which the investigator has little or no control (Robson, 2002; Yin, 2014), which makes the case study the most appropriate methodology for this phase of the research.

Remenyi *et al* (2002) and Yin (2014) identify a set of essential requirements for the design of case study research, including: the research must tell a story; it must draw on multiple sources of evidence; its evidence must be based on triangulation; it provides meaning in context; it demonstrates both an in-depth understanding of the central issue and a broad understanding of related issues and context; it has a clear focus on either an organisation, situation or context; and, finally, it is reasonably bonded. To achieve this, Yin (2014) identifies two main approaches to case study research: single case or multiple case design. Whilst the literature suggests the multiple case design is arguably more robust (Stake, 2005; Proverbs and Gameson, 2008; Yin, 2014), in his seminal work on case study design, Yin (2014) attests that the single case study approach is completely justifiable in any of the following five situations: the case is critical, testing a well formulated theory; the case is extreme or unique; the case is representative or typical; the case is revelatory; or, finally, the case is longitudinal.

The disparate nature of asset management and investment appraisal in the social housing sector (Gruis *et al,* 2003; Gruis, 2008; Mullins, 2010; Nieboer and Gruis, 2014), together with the widespread differences in asset management practice observed by successive researchers, including Albanese (2007), Gibb and Trebeck (2009) and Morrison (2013), called the suitability of a multiple case study design into question as, for a multiple case study design to work, the organisations identified must face the same commercial and market pressures and operate in a similar way. Yet, as the empirical evidence reported in the works of Gruis *et al* (2003) and Gruis (2008) showed, a significant number of different approaches are routinely adopted by social housing organisations. Furthermore, the unwillingness of several organisations to participate and the fact that the research aim did not call for organisational comparisons, which has been the principle justification for multi-case designs in the field of social housing asset

management (Albanese, 2007; Gruis, 2008; Gibb and Trebeck, 2009; Mullins, 2010) collectively called the achievability and validity of a multi case study approach into question. This limitation was also documented in the work of Albanese (2007) which, unlike this study, benefited from assistance and funding from the Housing Corporation.

As the above analysis suggests, a single case study design based on a typical registered social landlord operating in a community suffering from market failure was deemed to be the most appropriate approach for this study. The adoption of a single study design allowed the researcher to undertake a more detailed scrutiny of the organisation, thus strengthening the research (Wolcott, 1992) whilst also improving the study's validity (Proverbs and Gameson, 2008). Yin (2014) identifies two types of single case study: a holistic case study which examines an organisation as a whole, and an embedded case study which examines several departments or projects undertaken by an organisation.

The first stage of the case study research identified the main social and local economic phenomena that may influence the investment decision. A number of previous sociologically focused studies appraising the social phenomena associated with social housing estates have adopted a multi case study approach (Power, 1999; Lupton, 2003; Bashford and Shear, 2004; Turcu 2010:2013). However, due to the limitations identified in earlier models, where the survey of multiple estates has led to an abundance of variables triggering problems for users attempting to implement the tools in practice. It was resolved to implement a single holistic case study design for this research, which allowed the researcher to visit estates representing the best and worst of the stock before interviewing key stakeholders from across the organisation. The interview process allowed the researcher to identify the full range of sustainability phenomena relevant to the problem. However, the researcher had to ensure that the case study design used multiple sources of evidence which must be triangulated (Remenyi et al, 2002; Yin, 2014). To achieve this, Proverbs and Gameson (2008) suggest five possible data collection methods, including documents, archival records, interviews, observations and physical artefacts. The seminal works of both Power (1999) and Lupton (2003) adopted what Creswell (2013) terms a concurrent approach, in which researchers converge data in order to provide a comprehensive analysis. Using a similar approach, the researcher implemented a concurrent design, with data collected from direct observations, stakeholder interviews and, finally, earlier research through the development of a theoretical framework.

Having identified the various sustainability phenomena, the second stage of the case study sought to apply an objective score to these subjective phenomena. To facilitate this, the work adopted the *Delphi method*. This is a systematic, intuitive forecasting procedure used to obtain, exchange, and develop informed opinion on a particular topic. The objective of a Delphi study is therefore to "*obtain the most reliable consensus of opinion of a group of experts ... by a series of intensive questionnaires interspersed with controlled opinion feedback*" (Linstone and Turoff, 1975:54), in this case the important social and local economic phenomena when considering stock investment options. This process had the aim of allowing the *experts* involved to arrive at a consensus about what sustainability means for social housing at that level. However, the study asked the *experts* to score the phenomena during each iteration, allowing both a consensus in relation to the phenomena together with their relative importance values to emerge. The identification of the values, Meadows (1993) asserts, will be critical to any indicator-based comparative urban sustainability assessment model as the quantifiability of the comparative sustainability levels is the only way of selecting between the available options.

The final phase in the research design related to the validation of the conceptual framework. To validate the conceptual framework fully, it was clear that the sample drawn must be independent from the earlier stages of the research. Due to the need for a comprehensive discussion of the conceptual framework, quantitative research was deemed unsuitable due to the limitations identified by both Amaratunga *et al* (2002) and Craig (2007), discussed earlier. Given that one of the main features of qualitative research is that it is interactive (Parahoo, 2006), the final phase of data collection again adopted a qualitative design.

3.6   Research method

Within the textbooks aimed at guiding research students through the maze of available research methods (Naoum, 2007; Fellows and Liu, 2008; Farrell, 2011), there appears to be a consensus about the assertion that questionnaires and interviews are the two methods best suited to CM research. To validate this claim, Dainty (2008) reviewed 107 papers published in *Construction Management and Economics* Volume 24 (2006), of which, he observed, 76 used quantitative methods based primarily on questionnaire data, whilst 16 used qualitative methods, of which 12 (75%) adopted interviews. The

body of evidence clearly articulates the popularity and therefore suitability of both the questionnaire and personal interview, used either alone or together, as a basis for data collection.

Punch (1998) describes research as lying on a continuum between pre-specified (Deductive) and unfolding (Inductive), whilst data range from pre-structured to not pre-structured, being either quantitative or qualitative; however, quantitative data will be to the left of the continuum whilst qualitative data occupy a much wider range. Whilst some scholars such as Fielding and Gilbert (2006) opine that interviews offer very little benefit compared with questionnaires, others, such as Sapsford and Jupp (1996), assert that the differences could not be clearer. Questionnaire data are expressed numerically, so numbers bring structure to the data collected, based on either counting or scaling, whereas interview data take the form of people's words or researchers' observations or experiences.

3.6.1 Quantitative Data Collection

Surveys present researchers with an excellent tool for the collection of scientific information in a systematic manner about a set of cases (e.g. people, organisations, objects). The cases are selected from a defined population and the aim is to construct a dataset from which estimates can be made and conclusions reached about this population (Thomas, 1996). Fellows and Liu (2008:47) espouse the view that quantitative approaches tend to be developed from the positivist ontology and:

> "Seek to gather factual data, to study relationships between facts and how such facts and relationships accord with theories and the findings of any research executed previously".

The most common approach to the collection of such data both within the CM research (Dainty, 2008) and in the wider research community (Fellows and Liu, 2008) is the questionnaire. Questionnaires are conventionally used for both descriptive research, where the phenomenon to be measured describes something, and analytical research, where the researcher is seeking to appraise association or causality (Hoxley, 2008).

In either situation, the questionnaire allows researchers to gather data from a large number of respondents within a relatively short timeframe (Wilson, 1996; Simmons, 2008, Farrell, 2011). Both Fellow and Liu (2008) and Naoum (2007) identify further benefits to the use of questionnaires, including the benefits of economy to the researcher

as questionnaires assemble a mass of information at minimal financial and human resource expense, whilst also bringing additional benefits to the participants, who are only required a sacrifice five or ten minutes of their time to complete the survey instrument. Nonetheless, Fellows and Liu (2008) acknowledge that the disadvantages associated with the questionnaire include the difficulty of designing a good questionnaire, the possibility of a poor response rate and the risk that the shallow replies received will impact on the validity of the results. For this research, it was felt that the questionnaire constituted the most appropriate data collection approach, as it allowed any relationships within the data to be examined in detail whilst also taking up a minimum amount of the respondents' time. Although the possibility of low validity raised by Fellows and Liu (2008) does cause concern, it is hoped the multi-method design used in the research will eliminate any effects of weak validity.

3.6.2   Qualitative Data Collection

The use of the interview as a data collection tool allows researchers to capture some of the richness and complexity of their subject matter and explain it in a comprehensive way (Rubin and Rubin, 2005), providing highly in-depth data that would be un-obtainable using a questionnaire (Fellows and Liu, 2008). Precise, detailed data were needed to establish the present views of professionals about sustainability whilst also allowing the researcher to explore the dimensions of sustainability, which the industry identified as fundamental. Though the interview is not without its critics, Dainty (2008), for instance, argues that a concern about a possible over-reliance on the use of interviews within research have been raised within the wider social sciences, where the excessive use of interviews has been seen as both symptomatic of the interview society, whilst also belying the fact that interviews are themselves methodologically constructed social products. However, this argument, whilst raising valid concerns about excessive usage, does not question the validity of the interview as a data collection technique.

Fellows and Liu (2008) identify three formats of interview: un-structured, semi-structured and, finally, structured. The un-structured interview is seen as a 'powerful' research tool, which can achieve rich, valuable data (Punch, 1998) but which, due to the complexity of the analysis, is seldom used. Whilst the interviews would gather highly detailed and valuable data, the immense time commitment required to achieve the level of analysis needed to articulate meaning from the data (Arksey and Knight, 2002)

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means that this technique is impractical for this study due to the severe time constraints on it. At the opposite end of the spectrum is the structured interview. Aligned with the positivist epistemology, such interviews produce relatively simple descriptive information very quickly (Arksey and Knight, 2002). However, as structured interviews are likely to prevent the researcher from generating the levels of understanding needed, this technique was discounted.

The third approach identified by Fellows and Liu (2008) was the semi-structured interview, which provides a half-way house between the two extremes. Semi-structured interviews are widely used within the CM research (Dainty, 2008), possibly due to the capacity of semi-structured interviews to gather rich data, which allows researchers to understand how things work in the 'real world' (Kvale, 2007) whilst also making good use of time and resources, thus ensuring that the data gathered are relevant to the objectives of the study (Verma and Mallick, 1999). Consequently, the semi-structured interview was adopted as it allowed the researcher both sufficient scope to gather data pertaining to the meaning and values associated with the term 'sustainability', whilst also ensuring that comparable data were collected.

3.7   Research Ethics

The research study received full ethical approval prior to its commencement. To ensure the methods used within the study were undertaken ethically, all respondents were supplied with a detailed information sheet outlining the purposes of the study. In addition, prior to the commencement of the data collection, the participants were asked to provide their consent by completing a consent form. All participants were entitled to withdraw from the study at any time, and all data were confidentially stored and will be securely destroyed once the research has been completed. Furthermore, all participants were given the option to receive a summary of the data analysis for their information/records along with photocopies of the questionnaire or a transcript of the interview. A full set of the documents associated with the ethical approval are available on request.

Ethical approval for the PhD was applied for and approved by the University of Salford (see the Academic Audit and Governance Committee Research Ethics Panel decision reference REP11/089 in appendix 1). No further ethical approval has been sought, as the

data collection was concluded prior to the researcher's transfer to Sheffield Hallam University.

3.7.1 Positionality of the researcher

From the commencement of this study, the researcher held full chartered memberships of both the Chartered Institute of Building (CIOB) and the Chartered Association of Building Engineers (CABE). As part of these memberships the researcher was bound by the ethical standards laid down in the organisations by-laws. As such these memberships informed the researchers' ethical position and initial approach to the research. The methodology first proposed for this study, was also heavily influenced by the researcher's professional experience, as a Quantity Surveyor. As a result their view and understanding of housing largely related to the financial appraisal of the stock as part of the Decent Homes and Housing Market Renewal initiatives. The researchers' professional experience also resulted in a rather narrow view of sustainability, which in common with other built environment professionals, primarily focused on aspects of building physics related to energy management, together with some wider aspects of environmental sustainability such as the management of waste. The influence of these prospectives on the methodological design was to align the researcher with the rationalist epistemology widely adopted in CM research. With the researcher adopting a survey design based on a large scale questionnaire survey of practice, focused on certain aspects of property management. However, as the research evolved and the researcher engaged with both the housing and sustainability literature together with senior housing professionals, the researcher challenged their own narrow view of both housing and sustainability. Whilst these challenges did not change the researchers ethical prospective, the researchers personal and professional beliefs and understanding significantly widened. As a result the researchers' positionality shifted from one focused on sustainability through the lens of carbon reduction and energy management together with a narrow financial view of housing. To a wider prospective grounded in the theory of social capital and utilitarianism. As such the researcher now views the built environment as a park of the wider social processes in society. Therefore it is the researchers' thesis that buildings should not be constructed, refurbished or even maintained in isolation. Instead the researcher suggests, before such projects are implemented the societal impact of their development or refurbishment should be fully considered.

3.8   Chapter Summary

This chapter articulates the research strategy and methodological design for this PhD. It documents how the design is aligned with the four objectives of the study and implemented through four phases of activity. Phase one and two established the current state of the art of sustainable asset management practice. Building on the findings of this phase, the third phase moves towards a case study of a typical housing association to develop the conceptual framework for sustainable asset investment decisions, with the final phase validating the conceptual framework proposed. The next section of the thesis considers the analysis of the data collected during the initial data collection phase.

Chapter 4 Sustainability and Project Evaluation in the UK Social Housing Sector: An Exploration of Current Practice

4.1 Introduction

The previous chapter reviewed the research approaches adopted, outlining the theoretical and philosophical lens through which the work was grounded, before outlining the methods by which the research was conducted. The selection of the most appropriate research strategy and the justification for selection were elaborated.

This chapter reports on the initial phase of the data collection. Consisting of exploratory interviews and a subsequent large-scale survey, the data collection was undertaken to meet the first two objectives of the study. The exploratory interviews sought to evaluate how built environment professionals interpret policy documents pertaining to sustainability and how these interpretations influence the early stage evaluation of potential investment projects. Subsequently, a large-scale confirmatory survey was undertaken to validate the results, whilst also enabling the researcher to gain a comprehensive view of practice and further map the current state of the art in terms of the use of sustainable project appraisal tools. The survey also provides an improved understanding of how professionals in the UK social housing sector understand the principles of sustainability.

4.2 Exploratory Interviews

The Initial phase of the data collection aimed to evaluate how built environment professionals engaged at project delivery level both to interpret the policy guidance pertaining to sustainability and evidence how these interpretations influence the techniques used during the early stage evaluation of projects. It was deemed essential that the research gathered data from the sample in such a way that the viability of the later research was appraised, thus preventing the researcher from making what Farrell (2011) describes as an armchair evaluation of the problem confined to the bias of the researchers and their perception of the literature. In support of Farrell's assertion, Oppenheim (1992) advocates that the instigation of some form of exploratory survey should be a fundamental stage in the conceptualisation of the research hypotheses. As

such, the exploratory interviews were designed to explore current practice whilst also confirming the necessity and viability of the proposed study to both academia (Teddie and Tashakkori, 2009) and practice.

4.2.1 Interview Sample

Samples for quantitative research are frequently generated using the logic of the laws of probability and statistics (see section 4.4.3 for a full discussion). However, Mason (1996) suggests that qualitative research demands an alternative sampling logic. It is vital that the sample is selected using logic that is equally rigorous yet more appropriate to the research approach. Importantly, both the sample and data generated need to be representative of the population. It is therefore necessary to establish what the population is and select the sample based on an appropriate relationship with this wider universe.

To achieve a balanced view it was considered relevant to include all of those who are directly involved with asset management decisions within UK social housing organisations and local authorities. From this population, the participants were selected using discriminate sampling, thus maximising the opportunity for the collection of relevant data from a small sample (Fellows and Liu, 2008). The social housing organisations and local authorities were chosen to represent the full range of organisational types and scales of activity, with the local authorities selected on the basis of their annual budget allocated from the central HMR fund by a regional pathfinder organisation in 2009, whilst the social housing organisations where selected with the assistance of a senior housing practitioner. Again to ensure that the data were collected from the full range of organisations, the sample included housing associations (HA), registered social landlords (RSL) and arm's length management organisations (ALMO). Full details of the sample are provided in Table 4.1.

Interviewee	Role	Organisation
E01	Neighbourhood Renewal Manager	Large Local Authority
E02	Housing Manager	Medium Local Authority
E03	Director of Housing	Small Local Authority
E04	Director of Regeneration	Registered Social Landlord
E05	Director of Asset Management	Arm's Length Management Organisation
E06	Director of Development	National Housing Association
E07	Director of Asset Management	National Housing Association

Table 4.1: Exploratory Interviews Sample Frame

4.2.2 Interview Design

Rubbins and Rubbins (2005) opine that using interviews as a data collection tool allows researchers to capture some of the richness and complexity of the subject matter and explain it in a comprehensive way, thus providing in-depth data that would be un-obtainable when using a questionnaire (Fellows and Liu, 2008). Interviews were used in this study to establish the meanings and values that the built environment professionals associated with the term 'sustainability' whilst also exploring how the various aspects of sustainability deemed important informed the evaluation of asset management projects.

The interviews for this initial exploration were conducted with minimal structure, allowing the researcher to maximise the richness of the information gathered whilst also avoiding the pitfalls associated with interviewer bias (Farrell, 2011). The agenda for the interviews sought to focus the conversation on the main themes identified in the literature review, including sustainability, asset management and individual project delivery, with the interview framework comprising only a short list of bullet points intended to guide the interviewer around the interview, ensuring that the key themes arising from the literature were covered. This approach was sufficient to ensure the collection of comparable data, whilst also allowing the interviewee to shift the focus of the interview towards the issues that they felt were most prominent. All of the interviews were held at the participant's office, with each lasting approximately 45 minutes. The interviews were tape recorded with the consent of each participant, before being transcribed verbatim. Finally, each transcript was returned to the participant for comment and approval before the analysis commenced.

4.2.3. Data Analysis Framework

To analyse interview data, Walliman (2011:138) identifies six dominant approaches, including narrative analysis, conversation analysis, discourse analysis, semiotics, content analysis, and thematic analysis. Given the objectives for this phase of the research, the majority of the data collection techniques identified by Walliman are evidently unsuitable. For instance, Walliman (2011:142-3) identifies that semiotic analysis is used in situations where researchers wish to gain a deeper understanding of meaning by interpreting single elements of text or imagery. Clearly, such an approach would be unsuitable here, as the researcher is seeking to explore professionals' wider awareness and understanding of sustainable project appraisal in practice as opposed to the meanings associated with individual phrases.

Similarly, Earthy and Cronin (2008) opine that narrative analysis is often associated with the accounts people provide about their experience, role or life, thus providing a useful media through which to explore professionals' experiences of sustainability, as demonstrated in the work of Rawlinson and Farrell (2009), where narrative analysis was applied to evaluate people's experience of managing risk. Yet, narrative analysis requires the participants to provide clear accounts of their past, present or future in the form of a story (Walliman, 2011:142). This requirement is likely to prevent the researcher from exploring the full extent of practice, given the complexity of sustainability. Finally, discourse analysis provides researchers with the opportunity to explore verbal data (Wooffitt, 2008), although the data are not regarded as neutral, as the key premise of discourse analysis is that it allows researchers to analyse how people communicate with each other in a social context (Walliman, 2011:143). For this study, the researcher is not concerned with how the interviewees communicate; rather, the content of the interviews sits at the core of the work.

At the other end of the qualitative analysis spectrum, List (2005) identifies the possibility of applying content analysis. As with other forms of qualitative analysis, the focus remains on the words and text. However, the method is dominantly quantitative, whereby the results of the analysis are presented in the form of percentages and numbers (Smelser and Baltes, 2001). Yet, adopting such an approach would prevent the researcher from extracting the rich data that both Oppenheim (1992) and Farrell (2011) assert is needed to allow the problem to be fully understood.

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These difficulties, however, are overcome through the application of thematic analysis, which is a method for identifying, analysing, and reporting patterns or themes within data by minimally organising and describing the data in rich detail (Bazeley, 2013). Whilst the literature relating to thematic analysis provides contradictory advice, scholars such as Boyatzis (1998) and Ryan and Bernard (2000) identify thematic coding as a process performed *within* the 'major' analytic traditions such as grounded theory, rather than a specific approach in its own right. Conversely, Braun and Clarke (2006), writing in the highly regarded *Journal of Qualitative Research in Psychology*, present a significant body of evidence to support their argument that thematic analysis is a method in its own right. Despite the uncertainty regarding the base of the method, such an approach to analysis was suited to this research, as this technique allows the researcher to identify, analyse, and report patterns or themes, whilst also organising and describing the data in rich detail. Accordingly, the interviews were transcribed and thematically analysed using Braun and Clarke's (2006) framework, outlined in Table 4.2, together with Nvivo qualitative software.

Nvivo allows the researcher to arrange the data using a hierarchical tree structure. The central phenomenon (sustainability) formed the roots of the tree from which sub-categories or nodes were generated. As recommended by Bazeley (2007), an open coding approach was used, as this allowed the researcher to identify the various sub-categories associated with the central theme of sustainability.

Phase		Description of Process
1	Familiarise yourself with the data	Transcribing data, reading and re-reading the data, noting down initial ideas.
2	Generating initial codes	Coding interesting features of the data in a systematic fashion across the entire data set, collating data relevant to each code.
3	Searching for themes	Collating codes into potential themes, gathering all data relevant to each potential theme.
4	Reviewing themes	Checking in the themes work in relation to the coded extracts (Level 1) and the entire data set (Level 2) generating a thematic map of the analysis.
5	Defining and naming themes	Ongoing analysis to refine the specifics of each theme, and the overall story the analysis tells; generating clear definitions and names for each theme.
6	Producing the report	The final opportunity for analysis. Selection of vivid compelling extract examples, final analysis of extracts, relating back of the analysis to the research question and literature, producing a scholarly report of the analysis.

Table 4.2: Phases of Thematic Analysis (Braun and Clarke, 2006)

4.2.4. Reliability and Validity.

In quantitative studies, reliability refers to whether the same results would be reproduced by others using the same method, whilst validity is concerned with whether the study measures what it purports to measure (Knight and Ruddock, 2008). Qualitative inquiry is based on different assumptions about reality and a different worldview; some dismiss questions of reliability and validity as stemming from oppressive positivist concepts that hinder creative qualitative research (Kvale and Brinkman, 2009) while others, such as Merriam (1998) and Yin (2014), argue that, as a research design is supposed to represent a logical set of statements, it should be possible to judge the quality of any given design according to certain logical tests, including:

- Construct Validity – Identifying correct operational measures for the concepts being studied

- Internal Validity – Seeking to establish a causal relationship, whereby certain conditions are believed to lead to other conditions as distinguished from spurious relationships

- External Validity – Defining the domain to which a study's findings can be generalised

- Reliability – Demonstrating that the operations of a study – such as the data collection procedures can be repeated with the same results.

Ultimately, however, to ensure the validity and reliability of the results, the researcher employed a mixed method design, based on methodological triangulation, which made it possible to use the strengths of each method to overcome the inherent weaknesses of the others (Fellows and Liu, 2008). In this case, the strong reliability and external validity associated with a large scale survey together with the high internal and construct validity of exploratory interviews allowed the researcher to ensure that the conclusions drawn from this chapter were both valid and reliable.

4.2.5. Data Analysis: Exploratory Interviews

Sustainability and Sustainable Development

The first strand to be explored sought to establish the importance of sustainability and sustainable communities' rhetoric to the property investment decision-making process at both the strategic and project level. The interviews revealed a significant disparity between the acceptance of the government's policies as rhetoric and the actual acceptance of their implementation in practice.

The data suggest that, whilst all seven respondents demonstrated a sufficient understanding of the theoretical concepts and policy guidance relating to the key deliverables associated with sustainable development, and more specifically those associated with sustainable communities, as the discussions developed, it became increasingly clear that the three interviewees based in local authorities demonstrated an unwillingness to accept the importance of sustainability within the context of regeneration programmes/projects. The views expressed ranged from the smallest local authority, that accepted the importance of sustainability, but felt unable to comment

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further due to the limited scope of their own programmes, to the larger organisations, who expressed negative views towards sustainability:

> *"It's not a philosophy I subscribe to in all honesty as it's not really proven . . . economic regeneration takes time. We have boundaries. And we can't deal with everything. Such as rebuilding the job market in the area. . Social regeneration is more difficult and vulnerable to political whims as it's a long term goal". (E02)*

Conversely, the range of interviews held with professionals from social housing organisations demonstrated an unambiguous commitment to sustainable development and sustainable communities. Interviewee E07 identified:

> *"The thing that seems to be buzzing around at the moment is sustainability and we are very interested in trying to integrate that into our development policy". (E07)*

This theme was expanded by interviewee E04, who demonstrated their organisation's commitment to sustainable development through the narrative of a small case study recounting a recent project:

> *"The estate itself categorised as a major crime hotspot with significant problems associated with anti-social behaviour, outdated stock and predominantly social excluded . . .demolition would have been easier here, however we remodelled the estate transforming an unpopular housing estate to a mixed community and popular estate. . . .The asset management decision here really was fed by the appraisal of social, environment and economic benefits in deciding what the community wanted and delivering it". (E04)*

One very encouraging response highlighted that the government led top-down rhetoric which effectively forced sustainability onto organisations has ended. However, social housing providers have seen the importance of sustainability to their business and, as a result, housing associations have continued to assimilate sustainability into their activities because they believe it to be integral to their business:

> *"I know the Housing Corporation used to have the sustainability toolkit, going back three or four years ago. That seems to have*

dropped off now.   There doesn't seem to be a sustainability assessment that we have to adhere to anymore". (E06)

"At the moment we still think that we're trying to achieve sustainability for the neighbourhoods where we have stock. So it's still a common purpose. How we achieve that and how we fund that is going to be different". (E06)

Although the respondents also argue that the lack of usable and applicable sustainability frameworks remains a key difficulty in appraising projects. As the Director of Development at a large national social housing provider confirmed, commenting that the lack of available toolkits would prevent any meaningful sustainability appraisal of projects, with the toolkits used often being restricted to those identified as either essential to planning and other policies or those linked to the funding bodies' appraisal of projects:

"I suppose the only things that we can get hold of at the moment are Building for Life, Housing Quality Indicators and Code for Sustainable Homes. So that obviously is assessing the general effect of the design and local amenities, etc". (E06)

Despite the positive commitment to sustainability, the social housing professionals interviewed also tempered their comments by suggesting that, whilst sustainability is desirable, the bottom line evidently remains a key driver within the business cases developed and forwarded to the governance bodies of the organisation.

Low Demand and Low Demand housing

The literature clearly showed the correlation between sustainability and the phenomenon termed 'low demand', with the multiplicity of factors associated with low demand, spanning the three high level criteria associated with sustainability.

The analysis suggests that regeneration professionals working within local authorities are not fully conscious of the magnitude or multiplicity of the problem. All three professionals interviewed avowed that housing conditions were the deep-seated driver of the low demand and unpopular housing, advocating that such problems are the outcome of homeowners' low propensity to maintain and repair their homes:

"It all comes back to the condition of the stock . . . it is occupied by people who cannot for various reasons maintain it themselves. That is where we come in to carry out major maintenance for them and regenerate the housing". (E02)

In the social housing sector, this concern about the physical stock is partially supported. The development director from a national housing association suggested that the concerns about un-popular housing types and the potential market dynamics within the community can have a negative effect on demand levels:

" . . . Because it's a fairly mono-tenure estate [problem estate in Oldham] it's getting some potential for home ownership into those areas. A bit of movement in that sense". (E06)

Nonetheless, the responses revealed a bias, towards the physical condition of the housing stock, which may prevent such professionals from appreciating the other characteristics of low demand:

"We are guided by the Housing Act, which require certain levels of statutory unfitness or now the presence of category one hazards before we can intervene and regenerate". (E01)

There was, however, also a belief by one of the respondents (E02) that their approach to regeneration did also trigger some external benefits to the community, although these were less planned and more incidental.

"We may have a situation whereby physical improvement is needed, but other interventions are also required. We accept that people who live in poor housing generally have worse health and low confidence . . . improvement must reach out to contribute to these other problems such as improving the housing would improve the health of the occupants when joined to some other health services for example".
(E02)

Conversely, however, the built environment professionals working solely in the social housing sector demonstrated a thorough understanding of the problems of low demand. The regeneration director of one organisation identified unpopularity as being endemic in some pockets of housing. The interviewee suggested that, when appraising

regeneration interventions, all of the attributes of low demand should be fully assessed as part of the decision making process:

> *"If we are going to make decisions based on monetary costs alone we risk repeating our errors in the late 1980s where unviable or unsustainable estates were improved as they appeared to present a viable investment. Only for that estate to require further intervention five or six years later . . . That estate has since been demolished".*
> *(E04)*

Interviewee E04 also placed emphasis on a potential investment's appraisal, suggesting that a net present value assessment may suggest that projects make commercial sense in that they present the organisation with a financially balanced proposal, which achieves the desired rate of return. Yet, as this example demonstrates, it is paramount that the organisation fully appraises the socio-economic context in which the investment will be made to ensure that the net sustainable benefits also support the viability of the project. Yet, the interviewee alluded to the lack of assessment instruments which can provide an objective assessment of such benefits.

The Director of Development for a national social housing provider further reinforced this argument, although he opined that problems with low demand housing, often originated from the social engineering used within local authority housing departments, which created, so called "sink estates" in which difficult tenants would be housed. Identifying a number of such estates, the interviewee from a major social housing provider affirmed that, to correct the issues, organisations must look beyond the physical condition of the stock:

> *"So I think part of it's got to be around what the community want to see and what they expect to see in terms of it - direction of travel for the area. So is it about, as I say, opportunities and employment status, level of benefit dependency, the level of community activity and input into the community, those kind of factors, low turnover? They're all factors that suggest a settled neighbourhood and perhaps generation of local businesses and those kinds of things". (E06)*

However, this neighbourhood level view of potential problems was somewhat tempered by the final interviewee, again representing a large national social housing provider,

who argued that the problems may well be at neighbourhood level, but they could just as easily be attributable to one or two individual properties:

"Yes. I can think of, when you talk about single properties, individual properties that have been a bit of a honey pot to anti-social behaviour or otherwise. Maybe it's a corner shop that's closed down. Or it's a corner shop that's open and attracts the wrong kind of people. Then just altering - tackling that one issue can really alter the lives for people in that street". (E07)

In any case, during the course of the interview process, it quickly became apparent that social housing providers are facing significant difficulties in terms of low demand and unpopular housing, which is in urgent need of regeneration. Yet, Interviewee E07 alludes to the fact that the difficulties associated with making a viable commercial business case for intervention in such neighbourhoods has resulted in approaches which have not necessarily had a significant impact on communities:

"Yes. We haven't necessarily done any expansive sort of physical works on those estates in that respect, other than the planned work. It's been individual projects on some spare land. For instance, play areas, gardens or allotments and that kind of thing. We've had community projects of that nature. I suppose really we recognise we probably do need a more holistic approach to individual estates". (E07)

However, as both Interviewee E04 and E06 suggest, making any sort of business case for intervention in such neighbourhoods make financial and commercial sense, it needs to be supported with external funding:

"We had no real aspirations to regenerate those areas apart from to clear them and think in time what we were going to do and then in 2002 the M62 corridor stuff came out and elevate came out of that and we were fortunate to err the majority of the areas we cleared where HMR areas so the council then were then saying we could do with you building in these areas because we have plans to clear house stock and provide move on accommodation". (E04)

Whilst interviewee E06 admitted that further regeneration investment would not be possible without financial support, which is currently unavailable:

> *"I mean regeneration's not mentioned at all in the recent paper, local decisions – regeneration isn't something that's just on the map. . . . . .Funding stopped. There's new Regional Growth Fund that's being produced as a funding pot. The bids to that are supposed to be all about economic development and creation of jobs. That's the way that they're looking to grab that [funding at] this stage". (E06)*

Yet, the interviewee also admitted that, without some form of financial support to eradicate social exclusion and the other effects of unpopularity, the social failings exhibited in some pockets of the stock would continue along the same downward spiral:

> *"It doesn't mean it won't come back. Of course some of those social problems that may occur because of the new policies – trying not to be political here – may demand that regeneration activity continues". (E04)*

Asset Investment Decision Making

The final major theme within the research related to the feasibility evaluation of investment programmes. The literature suggested that such an evaluation would often exhibit a monetary focus, using either capital cost or whole life cost based investment appraisals. The final section of the interviews sought to identify the current approaches adopted by professionals in relation to project appraisal.

The data reveal the existence of a significant disparity between those professionals working in the local authority and the social housing sectors respectively. With the former, the discussions suggest that project evaluation is not the norm within the context of the projects, as these three professionals unanimously felt that the level and availability of funding actively prevented them from undertaking any meaningful feasibility appraisal of projects:

> *"I have a budget of £12,000 per property including all professional fees etc . . . what's the point of project evaluation?" (E01)*

The views expressed by the regeneration professionals suggest that any form of cost or value based planning and evaluation is presently unachievable within the regeneration

arena, given the importance of price ceilings in terms of maximum spending allowances.

Importantly, all three professionals were also of the opinion that the present funding system held back the achievement of sustainable regeneration. Indeed, the smallest local authority surveyed advocated that:

> "Our lack of funding is a major barrier to the implementation of any worthwhile regeneration". (E03)

Regrettably, as the local authorities increased in scale, and therefore their overall contribution of the total funding allowance increased, the views expressed by the smallest local authority continue to be exhibited:

> "If I want an impact I give a grant, but do we have enough funding to make an impact? The problem is if you're going into an area you need to do the lot and if you do half the area it will only have a 25 p.c. effect". (E03)

Finally, the professional employed by the largest local authority highlighted that:

> "I could achieve sustainable regeneration, indeed if you look at past works under SRB (Single Regeneration Budget) I did, but I spent typically £30,000 per property. Now it's an unrealistic dream on my budget of £12,000 per property including all professional fees etc. . . . if they want sustainable communities I need significantly more money". (E01)

Conversely, the experiences in the social housing sector would again appear not to support the views expressed above, as the interviewee from the housing association confirmed that investment appraisal at the project feasibility stage was fundamental to the decision making process although this often focused on the holistic assessment of a multiplicity of variables, which correlated with those identified in both the policy framework and literature associated with sustainability.

The commitment to the implementation of sustainability within asset investment appraisal was clearly important, as one interviewee demonstrated through the narrative of a small case study, recounting a recent project:

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"The estate itself was categorised as a major crime hotspot with significant problems associated with anti-social behaviour, outdated stock and predominantly socially excluded . . .demolition would have been easier here, however we remodelled the estate transforming an unpopular housing estate in to a mixed community and popular estate. . . .The asset management decision here really was fed by the "appraisal of social, environment and economic benefits in deciding what the community wanted and delivering it". (E04)

This approach was echoed by another interviewee, who simply stated:

"We have demolished significant quantities of property based on our assessment of both social attributes and physical condition". (E05)

Whilst it would appear that sustainability related variables are paramount and cost is secondary, an interviewee from the major housing associations explained that these outcomes are highly reflective of the stock:

"Transferred local authority stock is always problematic due to the vast amount of social and environmental problems they exhibit". *(E07)*

This is not to say, however, that the more commercially focused housing associations do not express the same commitment to sustainability. As one interviewee commented:

"We predominantly use capital cost appraisal models, the primary model we use does not really consider cost appraisals such as cost plans. We use the NPV (net present value) model, which compares costs against revenues to appraise the commercial sense of the investment. Although this looks economically focused, we do go beyond this. We use scrutiny panels to assess the wider potential benefits of the investment considering issues such as how the investment would support the community, but there must also be scrutiny against our strategic objectives". (E07)

However, another built environment professional, again responsible for development in a large national social housing provider, alluded to the possible reasons behind the cost driven appraisal of potential development projects, by suggesting that, whilst the

organisation's culture was to focus on the benefit potential associated with a project, the lack of a suitable framework for detailed appraisal made this difficult, with only the generic business case template, together with the financial appraisal, being put forward to the decision makers:

> *"Yes I mean I think we've definitely got a culture of that kind of business. . . . . .We're trying to say "Well before we put money in, how's it going to benefit where we put the money. . .we'll actually live with a deficit on this scheme because it supports our logistic investment in the area it supports existing communities that we want to focus on. So in that way we make some kind of value assessment but without using an particular toolkit . . . .but we have a business case format for projects so that contains those elements, It does ask you to set out what the outcomes will be. That's a fairly generic sort of business case model which can be applied to an IT project or the application of a creation of a new post". (E06.)*

Yet, as the Director of Development admitted:

> *"It remains a challenge for organisations like ours, because certainly on paper our finance directorate have one view of a project. We try to encourage them to come out and see the sensitive areas we work in. . . . yet the overriding business case for doing that scheme is financial . . . .A strong business case from that point of view is . . . .It fits with our stock, protects our investment. So benefit is appraised from the viewpoint of it [the project] essentially contributes to the upkeep of areas where we want to see values maintained because we have stock and we want that neighbourhood to be functioning". (E06)*

However, despite the assertions of the corporate governance arguments presented by some of the professionals, the Director of Housing of one ALMO organisation rejected the suggestion that boards block schemes due to financial data. Rather, he asserted, the boards are to some extent controlled by the financial directorate of the organisations:

> *"Absolutely, yes, but the NPV tool is great for the number crunching, but it doesn't give you the stuff underneath. It [the NPV] just gave us the answers we wanted. Again they were translationable until what*

*the board wanted, because the big model, the NPV model, was so
unwieldy and people [the board] didn't understand what the bloody
hell we were talking about". (E05)*

However, in his organisation, he argues that the impact of this has been diluted leading to innovative housing solutions which consider both the community benefits and the financial effect on the organisation:

*"I mean to be truthful, this company is pretty good. They [The board]
understand that you just can't look at numbers; you've got to get out
there . . . . We've stopped several projects at the last minute on the
realisation of what's happening culturally." (E05)*

4.3   Summary of Initial Findings

The data from the exploratory interviews   revealed that the professionals who are working in social housing are far more in-tune with sustainability than was originally suspected. It must be acknowledged that the data collection undertaken in the social housing sector is not yet generalisable and, as such, cannot be argued to be robust. Yet, the findings of the exploratory interviews concur with earlier work evident from the literature (Carter and Fortune, 2002; Cooper and Jones, 2009), indicating the strong desire within the social housing sector to embed the three high level criteria associated with sustainability within their practices. Yet, attempts to integrate sustainable benefit planning into the decision process requires further refinement as no apparent tool yet exists to facilitate this process, following the removal of the sustainability toolkit commissioned by the Housing Corporation.

4.4 Mapping the State of the Art

To minimise the effects associated with the small sample whilst also ensuring the validity and reliability of the findings, the findings from the exploratory interviews were confirmed using a wider questionnaire survey for which a more representative sample was drawn from the population.

4.4.1 Questionnaire Design

The main aim of the questionnaire was to collect real world data, in the form of the views and opinions of built environment professionals working in the UK social housing sector in order to map the state of the art in terms of project feasibility, the perceived importance of sustainability and, finally, the likely balance of sustainability needed.

The design of the questionnaire was developed around the core aim of appraising both practitioners' knowledge and awareness of sustainability and the state of the art in terms of tool usage. To achieve this, the questionnaire was split into three key sections. Section one gathered key demographic data about the organisation, including its size, maturity, origin and geographical focus. The second section gathered data relating to the organisations' asset management practice, including the focus and levels of investment, the data collected to inform the investment strategies and, finally, the tools used to appraise potential projects. Finally, the questionnaire sought to appraise the respondents' knowledge and understanding of sustainable development through a basket of questions relating to the three dimensions of sustainability. These questions were further supplemented by additional ones, which sought to evaluate the organisations' current policies and procedures relating to the attainment of sustainability, and the impact of these policies on the evaluation of projects.

The questionnaire is primarily concerned with the collection of attitudinal data, i.e. the perceptions and meaning of sustainability for the asset managers working in the UK social housing sector. Whilst this sort of data would advocate the use of open questions, attitudinal measuring scales are used instead which, as Opennihiem (1992) identifies, can be attitudinal as well as factual whilst directing and limiting the scope of the response. The most commonly used attitudinal scale is the Likert scale (Hoxley, 2008) which provides the respondent with a number of possible options from which to make a selection. The problem associated with the use of measurement scales, however, is the high degree of error found in the responses. To overcome this, a basket of questions or composite measurement is recommended (Wilson, 1996). On the questionnaire, the main themes have been approached using 'baskets of questions' in an attempt to obtain accurate opinions from the respondents. Whilst it must be acknowledged that such an approach to question design restricts the respondents' ability to express their opinions

and therefore limit the richness of the responses (Oppenheim, 1992), it does enhance the reliability of the survey instrument.

4.4.2 Questionnaire Piloting

Whenever a questionnaire is employed, it is widely asserted (McQueen and Knussen, 2002; Hoxley, 2008; Fellows and Liu, 2008) that it is fundamental to the success of the data collection that the instrument is piloted prior to issue. In designing the pilot, Bell (1996, p. 84) suggests that researchers should view piloting as a valuable opportunity to remove the bugs from of the instrument so that the subjects of the main study will not experience difficulties when completing it, with the pilot focused on testing, *inter alia*, the wording of the questions to identify any ambiguous or confusing statements together with the effectiveness of the invitation to respondents. Bell (ibid) proposed a set of potential questions that the researcher should ask during the piloting process. These include:

> ➢ How long did it take you to complete?
> ➢ Were the instructions clear?
> ➢ Were any of the questions unclear or ambiguous? If so, will you say which and why?
> ➢ Did you object to answering any of the questions?
> ➢ In your opinion, has any major topic been omitted?
> ➢ Was the layout of the questionnaire clear/attractive?
> ➢ Any comments?

Adopting Bell's evaluation questions, the survey instrument was piloted amongst a small group of social housing professionals working for the case study organisation. The respondents were asked to comment on the layout, content, rationale, and phrasing of the questions. Following the receipt of these comments, significant changes were made to some of the questions, to improve the layout and usability of the questionnaire.

4.4.3 Sampling and Sample Selection

Sampling is routinely used with questionnaire based empirical research, where the aim is, typically, to collect data for a relatively large population. Ideally, data would be collected from the entire population; however, this is rarely possible due to the financial

and time constraints of the researcher. Instead, researchers have built models of the real world in an attempt to provide an accurate representation of the phenomenon under study (Field, 2000), whereby a sample is a set of elements selected from the population (Fellows and Liu, 2008). Due to the time and financial restrictions of the researcher, it was impossible to conduct a survey of the full population of UK social housing providers. It was therefore necessary to conduct this part of the research with a subset of the population.

Yet, both Creswell (2013) and Buckingham and Saunders (2004) suggest that researchers should always aim to narrow the population's scope and purpose, arguing that researchers do not need to contact everybody in the sample to develop meaningful and accurate estimates. Instead, they advocate the use a sample derived from the total population which, if selected carefully and methodologically, can generate incredibly accurate estimates. However, to ensure the validity and therefore quality of the work, it is essential that the sample is designed to represent the entire population and, as such, it must sufficiently reflect the populations' characteristics (Naoum, 2012).

Cooper and Jones (2008) defined the limits of the population as consisting of 1900 private social housing providers together with a further 125 local authorities that still owned and managed their housing stock and 76 registered ALMOs. This was validated using the Housing Corporation's (2007) register of Social Housing Providers. Unfortunately, the closure of the Housing Corporation in 2011 meant that the data had become fragmented and displayed in an unusable format. To overcome these difficulties, the research sample has been drawn from a commercially available register of social housing providers published by the National Housing Federation.

In social science research, two approaches to sampling are customarily used: probabilistic and non-probabilistic sampling (Fellows and Liu, 2008). With *probability sampling*, all elements in the population have an opportunity to be included in the sample, and the mathematical probability that any one of them will be selected can be calculated. Probabilistic sampling methods include simple, systematic and stratified random sampling, multistage and multiphase sampling and, finally, cluster sampling. In contrast, *non-probability* or *purposive sampling* is based on some form of researcher intervention in the choice of the sample, with the sampling approach based on either the availability of the participants or because of the researcher's personal judgment that they are representative. The consequence is that an unknown portion of the population is

excluded. One of the most common types of non-probability sampling is *convenience* sampling, not because such samples are necessarily easy to recruit, but because researchers uses whatever individuals are available rather than selecting them from the entire population.

In selecting the sampling approach, Openhinem (1992) asserts that the sample should be drawn in such a way that every member of the population has a specified non-zero probability of being included in a sample that is, for the sake of argument, randomly selected. Whilst the use of a random sampling technique would appear suitable for this study, Sapsford (2007) advocates that, in some situations, a randomly selected sample can also be grossly unrepresentative of the population. To ensure that the sample matches the national distribution of social housing providers as closely as possible, Fink (2013) advises the adoption of the stratified random sampling technique, which permits researchers to choose a sample that represents the various groups and patterns that characterise the targeted population, whilst also homogenising the groups within a stratum, without which the findings may prove unrepresentative. Adopting stratified sampling, the researcher first used the Homes and Communities Agency (HCA) statistical return for 2011 as a guide to the approximate distribution of organisations by size within the population. The Excel worksheet generated from the National Housing Federation (NHF) database was subsequently re-constructed to represent the identified stratifications. Finally, the sample was randomly constructed from the database using the =RANDBETWEEN (1,n) equation to select organisations randomly within each stratified grouping according to the proportions identified in the HCA data. Whilst this approach may have increased the possibility of bias arising within the sample, the technique prevented the construction of an unrepresentative sample, thereby enhancing the validity of the results.

Sample Size

In their text on research methods, Fellows and Liu (2008:63-167) provide a comprehensive discussion on the mathematical appraisal of sample size. In principle, they argue that a sample should be CUES (Consistent Unbiased Efficient and Sufficient) compliant, asserting that, when some aspects of continuous data are to be collected from a non-normally distributed sample, researchers should devise a sample frame using the sampling formula proposed by Cochran (1977).

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$$n_0 = \frac{Z^2 pq}{e^2}$$

The calculation is valid where "n_0 is the sample size, Z^2 is the abscissa of the normal curve that cuts off an area 'a' at the tails where 1 - a equals the desired confidence level, e.g., 95%); 1, e is the desired level of precision; p is the estimated proportion of an attribute that is present in the population and q is 1-p" (Israel, 1992).

For CM research undertaken using a postal questionnaire survey, Akintoye (2000) asserts that the typical response rate will be in the order of 20-30%. Yet, when this is compared with the response rates achieved in research seeking to collect data from built environment professionals working in the UK social housing sector, returns of 12-15% appear typical (Albanese, 2007; Cooper and Jones, 2008). As such, the researcher assumed a return rate of 12% for this survey. The Z value is taken to be 95%, as deemed acceptable for social science research. The confidence interval has been set at 12%, which is again regarded as acceptable in the social sciences (Survey System, 2004). Finally, the percentage proportion of an attribute has been taken as the worst-case scenario of 50%, as recommended by Caust (n.d.)

$$n_0 = \frac{1.96^2 \times 0.5 \,(1 - 0.5)}{0.12^2} = 96.04$$

Substituting the pre-defined variables, a minimum sample return size of 67 was determined. To generate 67 returns, using the final simple formula (sss=ss/rr) and the anticipated 12% return rate, it was determined that a survey sample of 542 was required. As a result, the survey was issued to 550 housing associations operating in the UK. The postal survey was addressed to each organisation's asset management director. Following the initial posting and a follow-up e-mail communication, the survey achieved an overall response rate of 24.91% (n=135). However, 57 responses had to be eliminated from further consideration as they either provided incomplete data (n=27) or were returned due to having been wrongly addressed (n=30). This resulted in 78 usable responses, representing a response rate of 14.39%, which was still deemed acceptable, as lies within the range of 12-15% identified as typical for the sector (Albanese, 2007; Cooper and Jones, 2008). The number of valid responses was also adequate for the purposes of the statistical analysis. The response rate was therefore believed to be appropriate for the study.

4.4.4 Reliability and Validity

Reliability and validity are important aspects of data collection. Reliability is concerned with data consistency whilst validity is a test of whether the study measures what it purports to measure (Knight and Ruddock, 2008). The reliability of the research instrument and the data generated can be measured using Cronbach's alpha, which represents the ratio between the true and observed variance (Yin, 2014).

The test reveals that on the fifty-six measures within the questionnaire the Cronbach's Alpha statistic was 0.766. Hair *et al* (1998) declared that a low value indicates that the data were not homogeneous or that the sample of items performs poorly in capturing the construct or component. As a guide Hair *et al (1998)* recommend Cronbach *alpha* should be higher than 0.7. This is confirmed by Garth (n.d.) who opines that a co-efficient of .70 or higher is considered 'acceptable' in social science research. As the question achieved 0.766 this would suggest the data collected is reliable and can be used.

Cronbach's Alpha	N of Items
.766	56

Table 4.3: Cronbach's Alpha test for reliability.

Replies were received from 78 organisations, representing a 14.39% response rate. In assessing the validity of the sample, two potential appraisal techniques were applied. The first compared the profiles of the respondent organisations with the overall profile of the PSPs within the sector, based on the Homes and Communities Agency statistical release for 2012/13. Using this approach to assess viability, it was discovered that the demographics of the respondents do not correspond to the profile of Private Social Providers (PSPs) within the statistical return data, suggesting that the results may not be applicable outside the sample. However, Cooper and Jones (2008:39), in reporting their initial findings to the EPSRC funding council, attested that the validity of the findings can be assessed by apprising the number of units managed by the respondents as compared to the total stock managed by the population. Using this comparison, it was estimated that the respondent organizations managed 344,000-534,000 properties, compared to a total national stock holding of 4,000,000, based on the latest English Housing Survey (DCLG, 2013), translating to a sample of 8.6-13.35% of the total stock.

Finally, the HCA statistical return (HCA, 2013:6) additionally evidenced that larger organizations collectively own over 90% of the housing stock. Based on Cooper and Jones (2008) guidance and the fact that larger organizations own over 90% of the stock, and constitute the largest respondent group, the author opines that the sample is representative of the population and therefore that the research is valid.

4.4.5 Data Analysis Framework and Statistical Testing

The raw data were compiled on a Microsoft Excel spreadsheet, then imported into PASW 18 (Predictive Analysis Software) for analysis. To facilitate the analysis, each question on the questionnaire was coded using the coding framework provided by Farrell (2011:84).

Statistical Tests

Fellows and Liu (2008) identify that, although statistics may be classified in different ways, one important, albeit basic classification is between *descriptive* and *analytic* statistics. In the former, the data are analysed using measures of central tendency as a way of expressing important features of the sample and identifying potential relationships within it. In the first section of this chapter (*results*), simple descriptive tests were applied to the data, generating a range of tables and charts highlighting the potential relationships. The second section of the chapter (*analysis*) used inferential statistical tests to draw conclusions about the wider population through hypothesis testing and an estimation of the population parameters (Calder and Sapsford, 2006). However, the use of a statistical test can only be established if a relationship within the data is significant, or has not occurred by chance. As the initial analysis of the data in Section 5.5.1 shows, the data are not normally distributed and so only the less powerful, non-parametric tests, including the Chi-Square; Cramer's V and Kendall's tau, could be used.

The Chi-square test is a useful measure for appraising if there is a significant association between two categorical variables. The test compares the expected values with the observed ones to appraise the significance of the relationship. However, the test fails to measure the strength of association in any relationship between the dependant (DV) and independent variable (IV). The Cramer's V test, again used with categorical data, can however be applied following the Chi-square test to appraise the

strength of the association between the DV and IV. The third statistical test, the Kendall's tau, is useful for testing the correlations between sets of variables. The output of a Kendall's tau test determines the strength and direction of covariance. Covariance exists when change in one variable is matched by a similar change in another variable.

4.4.6 Survey Results

The following section presents the results of the survey together with the initial findings from the descriptive analysis, with the responses to each question appraised in turn. At the end of each section, an overview summarising the results is provided. An inferential statistical analysis of the results is presented in Section 4.5.

Respondent Characteristics

The first part of the questionnaire established the characteristics of the social housing sector in terms of: the number of properties owned and managed; the scope of their operations in terms of geographical focus; the maturity of their organisation; and, finally, the organisation's preferred title. The questionnaire also sought to establish the extent to which each respondent faced the difficult challenge of managing unpopular properties.

Questions 1 and 2: Classification and origin of the respondent organisations

Based on the literature, the questionnaire included the following five commonly used classifications: Registered Social Landlord (RSL); Arm's Length management organization (ALMO); Housing Association (HA); Local authority; and other. As Figure 4.1 shows, of the 78 organisations that responded to the survey, 33% defined themselves as HAs; 58% as RSLs; and the remaining 9% as ALMOs, with no respondents selecting either *local authority* or *other,* despite the fact that the current policy refers to all social housing providers as *private social providers (PSPs).* This avoidance of the current official classification suggests that the self-determined classifications identified during the exploratory interviews are routinely adopted in wider practice.
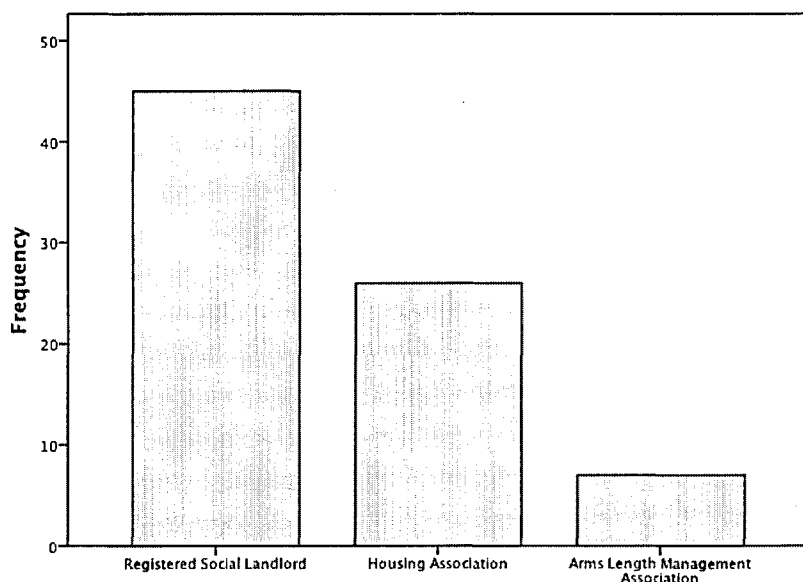
Figure 4.1: organisational type.

The data also revealed that 40% of the organizations that responded to the survey had been formed as a result of local authority housing stock transfer.
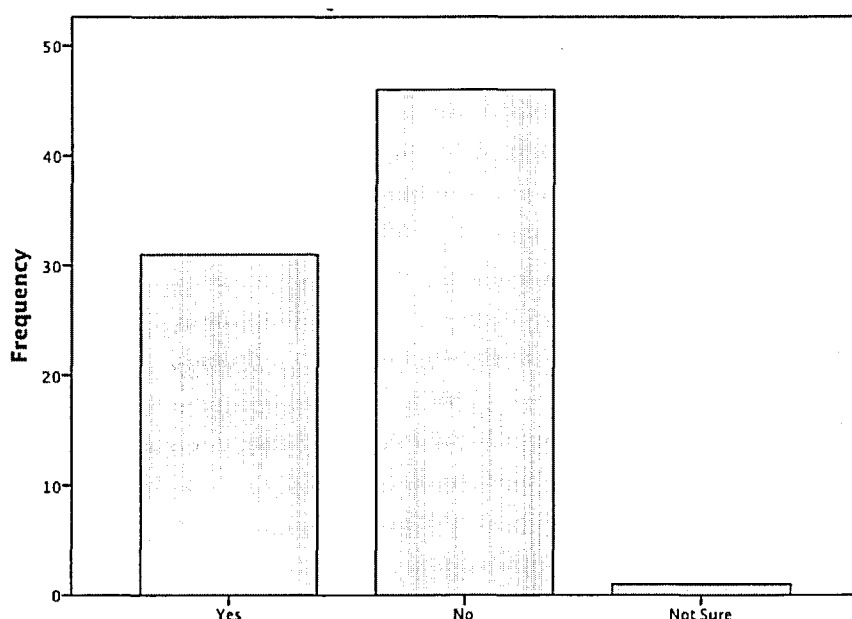
Figure 4.2: Formation resulting from stock transfer.

Question 3: Year of incorporation

This question sought to appraise the spread of the respondent organisations that took part in the survey. As Figure 4.3 illustrates, the respondent organisations were formed between 1885 and 2012. In an attempt to simplify the data to aid analysis, the

researcher re-coded them using three key clusters of organisational evolution identified by Pawson and Fancy (2003):

I.   Pre-1989 organisations, typically founded due to philanthropic motivation.

II. Newer organisations formed following significant changes to the management and financing of local authority stock. With changes imposed under both the 1988 Housing Act and the subsequent 1989 Local Government and Housing Act, collectively the legislation imposed significant changes on tenant choice, substantial rental increases and the cross subsidy of housing benefit.

III. Finally, the transfers occurring following the 1997 general election which, once again, signalled a major politically driven shift in housing policy, with the government offering to write off the housing debt of local authorities who transferred their housing stock (Malpass and Mullins, 2002:684).
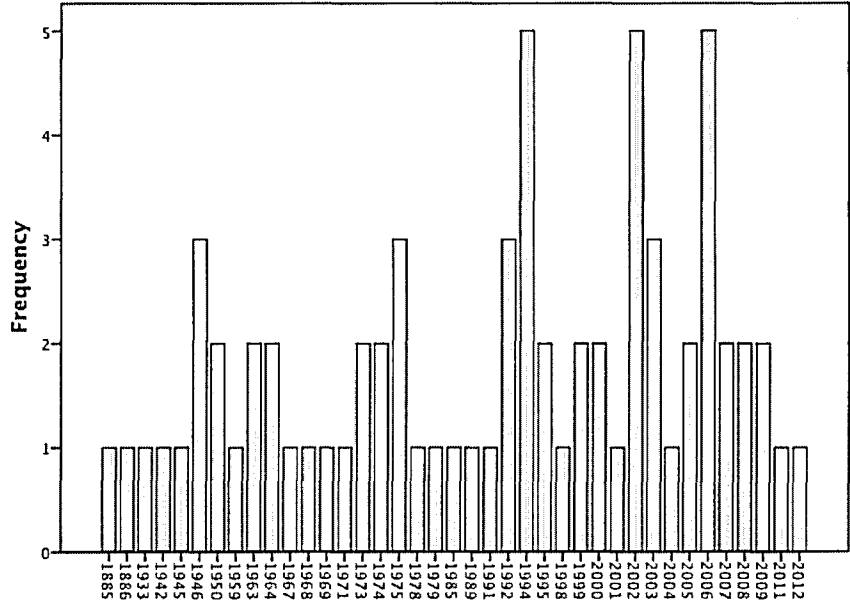
Figure 4.3: Spread of formation dates

Using these generational clusters, the data was re-coded into four categories: pre-1989 to capture organisations formed before the first significant policy change; 1989-1999 to capture organisations formed because of the stock transfers facilitated by the 1988 Housing Act; post 2000 to capture organisations formed following the last major change to housing legislation, enacted within the 1999 Housing Act; and a final *unsure* category to capture organisations that were unsure about or unwilling to disclose their historical origin.

	Frequency	Percentage
Pre-1989	29	37.18
1989 – 1999	15	19.23
Post 2000	27	34.62
Unsure	7	8.97

Table 4.4: Organisational classification (recoded)

To establish if these legislative changes did indeed trigger increased housing transfer activity a simple cross-tabulation was undertaken between the re-coded data and the stock transfer data from question 2. The results shown in table 4.5 suggest that whilst changes to policy environment triggered stock transfers, this does not appear to be the only factor responsible for organisational formations within each of the loose generational clusters identified.

	Stock Transfer			Total
	Yes	No	Unsure	
Pre-1989	1	28	0	29
1989-1999	11	4	0	15
Post-2000	16	10	1	27
Unsure	3	4	1	7

Table 4.5: Organisation age by stock transfer

Question 4: Number of units

The number of properties owned by each respondent's organization is represented in Figure 4.4. Thirty percent of the responding organizations owned over 10,000 units. The other respondent groups were almost equal in size (22-24%).
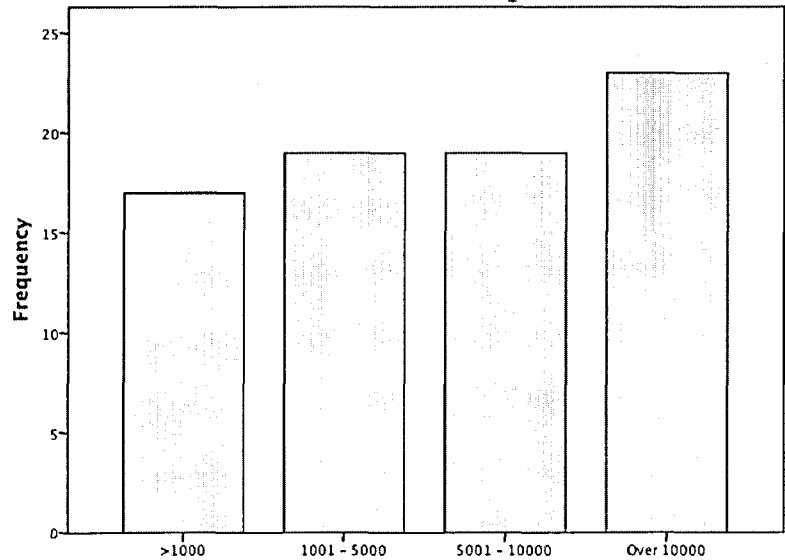
Figure 4.4: Size of organisation

As shown in table 4.6 the demographics of the respondents do not correspond to the profile of PSPs reported in the Homes and Communities Agency's statistical release for 2012/13. A significantly higher than expected proportion of the response was received from organizations owning over 5,000 units. There are several potential explanations for this. It may be the result of sample bias or a greater willingness or capacity in this size of organization to become involved in research. Finally, as the HCA statistical return (HCA, 2013:6) evidenced, such organizations collectively own over 90% of the housing stock, suggesting they may have felt better placed to respond to the survey. Nonetheless the results raise important questions about the validity of the findings outside the sample.

| | Percentage by units owned | | | |
	>1,000	1001-5000	5001-10,000	>10,000
ALL	91.0%	4.1%		4.9%
Survey Respondents	21.8%	24.4%	24.4%	29.5%

Table 4.6: Profile of the PSP sector (HCA, 2013:6)

Question 5: Geographical Focus

The majority of survey respondents operated specifically within their own local community (43) or at a regional level (27). Only eight organisations responding to the survey operated nationally, of those 75% (6) owned over 10,000 units.

	Frequency	Percent	Valid Percent	Cumulative Percent
Immediate Locality	43	55.1	55.1	55.1
Regionally	27	34.6	34.6	89.7
Nationally	8	10.3	10.3	100.0
Total	78	100.0	100.0	

Table 4.7: Geographical focus

More of the large PSPs, however, identified themselves as operating either locally (8) or regionally (9). Surprisingly, two registered providers with less than 1,000 properties identified themselves as operating nationally. This result is assumed to be a case of respondent error. However, it is also possible these are highly specialised providers, as

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the HCA statistical return alludes to specialist subsets of social housing provision such as 'supported housing' which maybe outside the expertise of typical organisations.

		Geographical focus			Total
		Local	Regional	National	
Organisational Size	>1,000	10	5	2	17
	1001-5000	13	6	0	19
	5001-10,000	12	7	0	19
	>10,000	8	9	6	23

Table 4.8: Geographical focus by organisation size

Of the 43 organisations operating within their local area, 21 had been created following the transfer of housing from the local authority. Yet, the data reveal that some providers have subsequently diversified their business operations, with nine operating regionally and one operating nationally.

		Geographical focus			Total
		Local	Regional	National	
Stock Transfer	Yes	21	9	1	17
	No	22	17	7	19
	Not Sure	0	1	0	19

Table 4.9: Stock transfer by geographical focus

Question 6: Extent of Low demand Stock

Both the literature and findings from the exploratory interviews highlighted that the nature of the housing stock was a potential driver of asset management, with Kiddle (2002) opining that a failure to overcome the problems of low demand could, in extreme cases, result in insolvency. In an attempt to clarify this point, the question sought to appraise the extent to which each survey respondent's stock could be classified as either unpopular or socially excluded. Based on Bramley *et al*'s work (2004), it was expected that these organisations were formed because of a stock transfer and so, in continuing to operate in their immediate locality, would be most susceptible to such difficulties.

As the data in figure 4.5 reveal, the majority of the survey respondents suggested that their stock includes unpopular housing, with 61 respondents identifying that as much as 40% of their stock is exhibiting the symptoms of low demand.
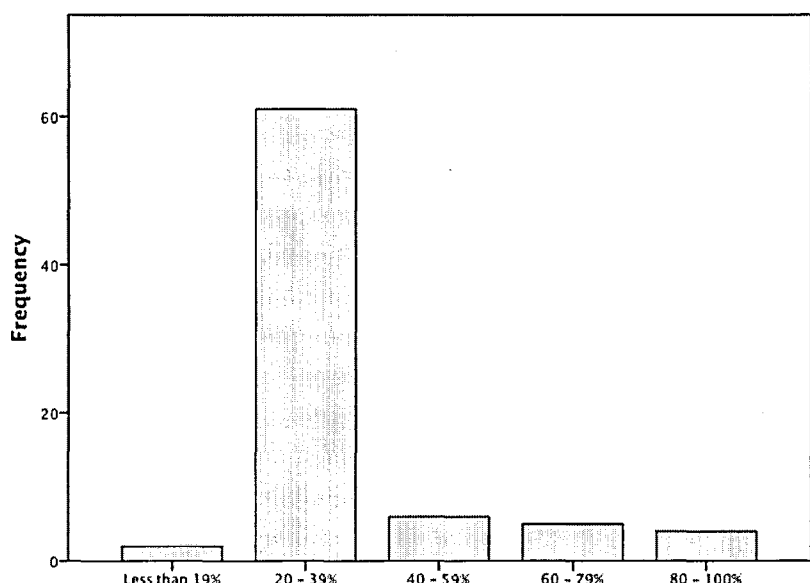
Figure 4.5: Percentage of low demand housing stock

A cross tabulation of the data with the geographical scope of each organisation, shown in Table 4.10, reveals that over 50% (n=36) of the organisations suffering from moderate levels of low demand (20-40%) restricted their operations to their immediate locality. In light of Kiddle's (2002) observations, this finding raises important questions about the long term commercial viability of some of the organisations responding to this survey.

		Percentage in Low Demand					
		Less than 19%	20 - 39%	40 - 59%	60 - 79%	80 - 100%	Total
Operational Context	Immediate Locality	1	36	1	2	3	43
	Regionally	0	21	3	2	1	27
	Nationally	1	4	2	1	0	8

Table 4.10: Geographical focus by percentage of low demand stock

Overview of Respondent Characteristics

The demographic data collected revealed that the majority of the survey respondents favour traditional labels such as 'RSL' or 'HA' rather than the current policy label of *private social provider*. Whilst the primary focus of this section was on developing a demographic profile of the respondent organisations, it is nonetheless clear that the dispersion of difficult to manage housing stock is far wider than was originally suspected, with organisations that have not been formed from local authority stock

identifying the phenomena within their stock profile. The results have also revealed that a number of organisations may be at financial risk due to the ineffective management of the existing stock, with features identified by Kiddle (2002) evident in 36 respondent organisations. Finally, the analysis suggests that the data were collected from across the generational clusters identified in the work of Pawson and Fancy (2003), thus enhancing the validity of the findings.

Asset Management Strategy

The second section of the questionnaire collected information about the survey respondents' approach to asset management. The first question sought to establish the distribution of investment over the three financial years, from 2011 to 2013. This was of interest as it allowed the researcher partially to validate the currency of the research. Subsequent questions sought to appraise how asset management was implemented in practice, with questions evaluating, *inter alia,* the information used to develop an asset management strategy and the use of project appraisal tools.

Question 7: Number of units developed or refurbished between April 2011 and March 2014.

The question sought to appraise the maturity and nature of the ongoing development work including, both new build and refurbishment schemes, undertaken by the survey respondents. To appraise the nature of investment activity, the respondents were asked to specify the number of new units constructed and the number of existing units refurbished over the three-year period from April 2011 to March 2014. The findings shown in Table 4.11 reveal that 93-97% of the respondents commissioned new build developments over the period, whereas 91-93% of the survey respondents commissioned refurbishment projects.

	Cases				
	Organisations involved		Development size (Units)		
	N	Percent	Total	Mean size	Std Dev
New Development					
Last Year	75	96.92%	7439	99.19	193.09
Current Year	74	94.87%	7083	95.72	173.41
Next Year	73	93.59%	7581	103.85	178.00
Refurbishment					
Last Year	72	92.31%	10634	147.69	220.70
Current Year	71	91.03%	11803	166.24	252.07
Next Year	71	91.03%	10502	147.92	222.12

Table 4.11: Investment distribution: April 2011 to March 2014.

The trend data mapped over the three-year period between April 2011 and March 2014 revealed a significant change in the spread of commissioned work, since a similar question was asked in 2005 in Carter's doctorial work. Carter (2005) reported that social housing providers were routinely commissioning between 10,000 and 15,000 new build properties per annum between 2002 and 2005. However, since this time, the political horizon has changed, with the coalition government's emergency budget of 2010 drastically cutting the funding available for the development of affordable housing. The data in table 4.11 clearly document the effect of this spending change, with the number of new properties constructed halving from 15,000 in 2005 to an average of 7,500 between 2011 and 2013. Yet, this change appears to have prompted social housing providers to consider investing in the refurbishment of their existing stock, with the survey respondents reporting that between 10,500 and 11,800 dwellings were refurbished between 2011 and 2013, representing a 400% increase in the levels of refurbishment reported by Carter (2005:226).

Question 8: Distribution of Asset Investment: April 2011 – April 2012.

The survey respondents were asked about the distribution of their annual asset management budgets. Despite the reductions in new development reported in question 7, the results shown in Figure 4.6 reveal that the construction of new affordable housing still accounts for 23% of the total annual investment made by social housing providers. As expected, planned and reactive maintenance activity accounts for a high proportion of the social housing providers' annual expenditure, with many spending over 50% of their annual budget on the upkeep of the exiting stock. Yet, despite the growth in the number of refurbishments undertaken, as reported in question 7 and confirmed in Figure

4.6, investment in significant transformation and remodelling schemes only accounted for 4% of the annual investment expenditure, with less comprehensive refurbishment projects accounting for a further 6%. However, work on energy efficiency and decent homes continues to account for 30% of annual investment.
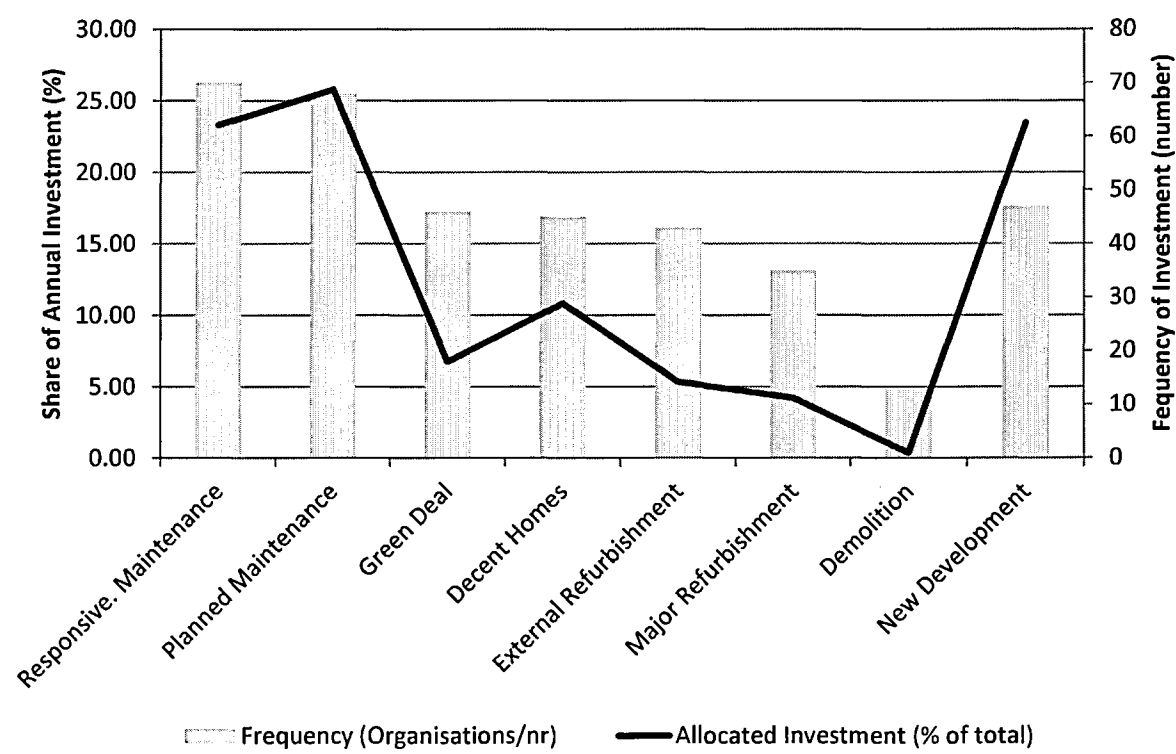
Figure 4.6: Distribution of annual asset investment by percentage share and frequency

Question 10: Data considered within the asset management strategy

Cooper and Jones' (2008) survey of social housing maintenance managers reported that 92% of the respondents identified the condition survey as the primary information source for maintenance decisions, given that maintenance is seen as an important aspect of the overall approach to asset management, accounting for over 50% of annual investment. The question sought to appraise the extent to which the five yearly condition surveys were used to inform other aspects of the asset management process by evaluating the use of other sources of information. The question simply asked the respondents if any of the common information sources identified from the literature were routinely used by the respondents. Surprisingly, the results shown in Figures 4.7 and 4.8 reveal that less than 50% of the survey respondents used the strategic information routinely collected by their organisation, with only 39% of the survey respondents considering market intelligence and 43% using the information to

undertake some form of estate viability assessment. The results suggest that the conventional condition data and associated financial appraisals continue to play a significant role within the asset management process.
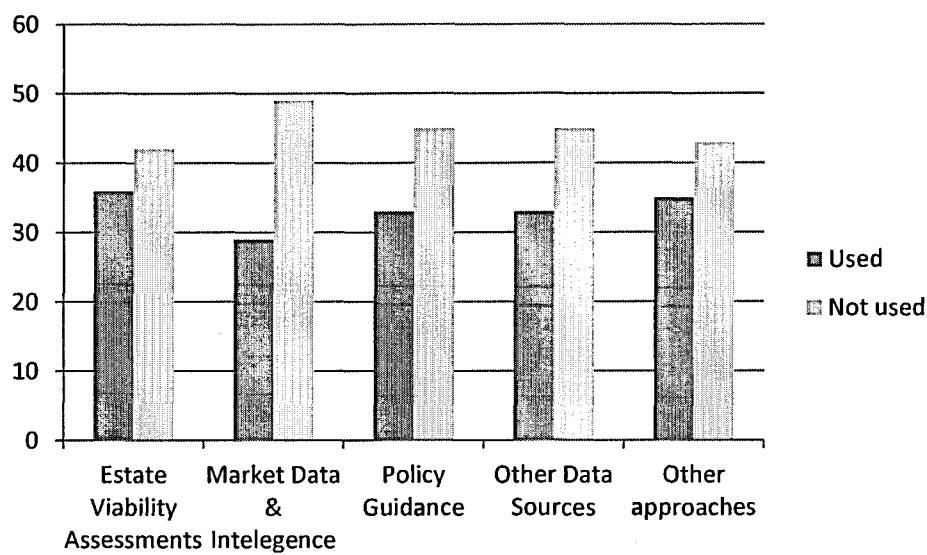
Figure 4.7: Information usage (frequency)
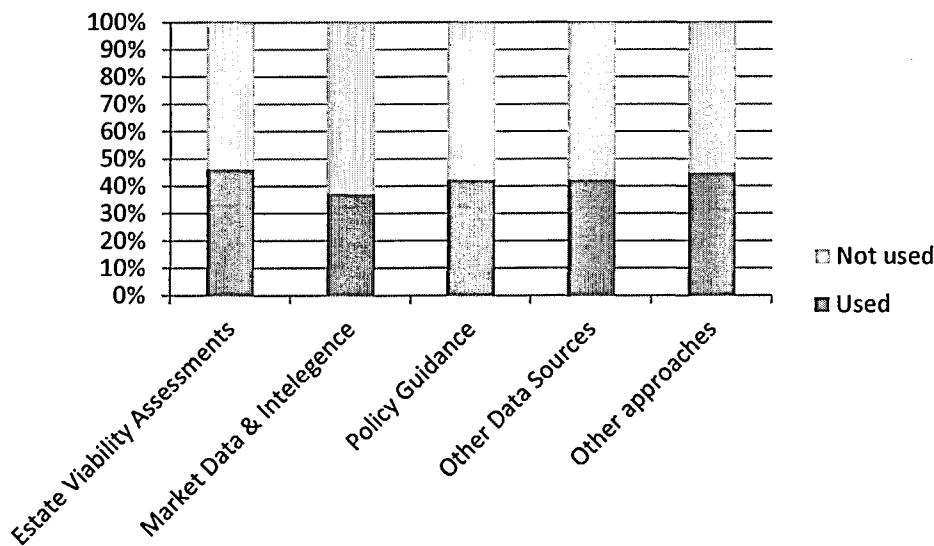
Figure 4.8: Information usage (Percentages).

The data was further analysed to appraise whether those organisations operating with between 20% and 40% of their stock categorised as low demand which Kiddle (2003) suggested presented a high risk of insolvency were more likely to undertake commercial appraisals of their stock. The results of a cross tabulation between the two major sources of information and levels of low demand shown in tables 4.12 and 4.13 revealed that despite the warnings about business insolvency these organisations were equally as

unlikely to consider the strategic data collected routinely by their organisation when evaluating the existing stock. Confirming the observations from literature which suggested only a limited number of social housing organisations routinely undertook commercially focused strategic asset management, despite the very real risks associated with difficult to let housing in an increasingly commercialised sector.

		Percentages for Low Demand					
		Less than 19%	20 - 39%	40 - 59%	60 - 79%	80 - 100%	Total
Estate Viability Assessments	Yes	1	26	5	3	1	36
	No	1	35	1	2	3	42

Table 4.12: Frequency of PSPs with low demand stock evaluating estate viability

		Percentages for Low Demand					
		Less than 19%	20 - 39%	40 - 59%	60 - 79%	80 - 100%	Total
Collecting market intelligence	Yes	0	24	2	2	1	29
	No	2	37	4	3	3	49

Table 4.13: Frequency of PSPs with low demand stock using market intelligence

Question 11: Use of Project Appraisal Tools

The survey included the toolkits and models identified from the previous literature review, including 'life cycle and capital cost analysis', 'net present value', cost benefit analysis'. 'social return on investment', 'internal rate of return', 'bespoke in-house systems', social impact assessment', 'national housing federation framework' developed by Treanor and Walker, (2004), 'Eco-Homes XB', 'social capital studies', 'commercially developed proprietary systems' and, finally, the 'Property Reinvestment Strategy Model' (PRISM), developed by the William Sutton Housing Association and subsequently adopted by a number of other social housing organisations (Humphries, 2003). Adopting a four point likert scale, ranging from *always use* to *never use*, the respondents were asked to rank the toolkits based on both their usage and their frequency of use.

The results shown in Table 4.14 reveal that, in terms of the incidence of in-use of the listed toolkits, conventional finance based toolkits including cost planning (75,64%), net present value (71.79%) and life cycle modelling (80.77%) continue to be the tools that

are most used in project investment decision-making practice. Despite calls from academia for a shift away from monetary derived tools for the evaluation of housing projects, the survey has shown that the newer, more sustainability led tools are being used but are not as yet generally adopted by practice, with the results indicating that the least used models were those developed specifically to address the wider socio-economic implications of future investment schemes, such as the National Housing Federation Framework, Eco Homes XB, Social Capital Studies, Proprietary System and PRISM.

Appraisal Models	Never (0)	Hardly Ever (1)	Occasionally (2)	Always (3)	Incidence in Use (%)	Mean Rating	Std. Dev.
Capital Cost	19	3	10	46	75.64	2.06	1.272
Life Cycle Cost Analysis	15	6	25	32	80.77	1.95	1.127
Discounted Cash Flow (using NPV)	22	8	11	37	71.79	1.81	1.300
Cost Benefit Analysis	22	10	20	26	71.79	1.64	1.216
Own In-House system	32	6	9	30	58.97	1.51	1.393
Social Return on Investment	26	14	29	9	66.67	1.27	1.053
Discounted Cash Flow (using IRR)	30	15	15	18	61.54	1.27	1.203
Social Impact Assessment	40	17	13	8	48.72	1.06	1.061
National Housing Federation Framework	46	11	17	4	41.03	0.73	0.976
Proprietary System	55	3	8	12	29.49	0.71	1.163
Eco Homes XB	50	17	9	2	35.9	0.53	0.801
Social Capital Studies	51	16	10	1	34.62	0.50	0.769
P.R.I.S.M.	63	13	2	0	19.23	0.22	0.474

Table 4.14: Project appraisal toolkit usage

Table 4.14 further shows that there is a strong relationship between the models and toolkits in general use and the perceptions of the practitioners regarding their usefulness, with Table 4.14 evidencing that, when the survey respondent's mean rankings for each model are considered, the most conventional toolkit, namely the capital cost model, is found to be the most useful.

Overview of the Asset Management approach

Despite the difficult financial climate and cuts to public funding, 90% of the survey respondents revealed that they have continued to invest in both new development and stock refurbishment activities. The data collected for the three financial years from April 2011 to March 2014 reveals that the levels of investment are relatively static, with approximately 7,500 new affordable homes developed and a further 10,000 existing properties refurbished. Over a longer time horizon, comparing the levels of investment with those reported in the work of Carter (2005), the comparison revealed a 50% fall in the development of new social housing, whereas refurbishment increased by 400%. Despite the apparently high levels of refurbishment, the survey has also shown that refurbishment only accounted for 10% of annual expenditure, with 53% of annual expenditure concentrated on planning and reactive maintenance.

Looking at how organisations plan and evaluate asset investment, the respondents revealed that the condition survey together with conventional economic appraisals continue to dominate the decision environment. Even those organisations that experienced a moderate level of difficulty in managing housing were unlikely to collect the types of neighbourhood information advocated by (Overmeeren and Gruis, 2011). Finally, the data suggested that the call from academia (Bell, 1981; Carter, 2005; Essa, 2008) for a 'paradigm shift' towards the general evaluation of social housing interventions based on multiple attributes, rather than solely on the projects' economic merits has not yet been generally achieved.

Sustainability Strategies

The final part of the questionnaire collected information on the existence and profile of the sustainable development (SD) policies. The first question sought to establish if the respondents' employer had or was developing a sustainable policy. This was of interest as it was hypothesised that the introduction of such a policy was likely to influence the adoption of value-focused tools for the appraisal of potential projects. As such, the respondents working for organisations with an SD policy in place were asked about its impact on project evaluation. Subsequent questions sought to appraise the balance of SD policies in terms of social, economic and environmental sustainability. Finally, the respondents were asked about the significance of several features of sustainability identified in the seminal work of Long and Hutchins (2003) in an attempt to understand the preliminary focus of the value based project appraisals.

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Question 12: sustainable development policies

Carter (2005) identified that organisations' implementation of a SD policy provides a useful indicator by which corporate commitment to sustainable development can be appraised. Yet, as Figure 4.9 shows, only 54.67% of the organisations included in the survey had a sustainable development policy in place as of autumn 2012, although a further 19% of respondents suggested their organisation was developing an SD policy.
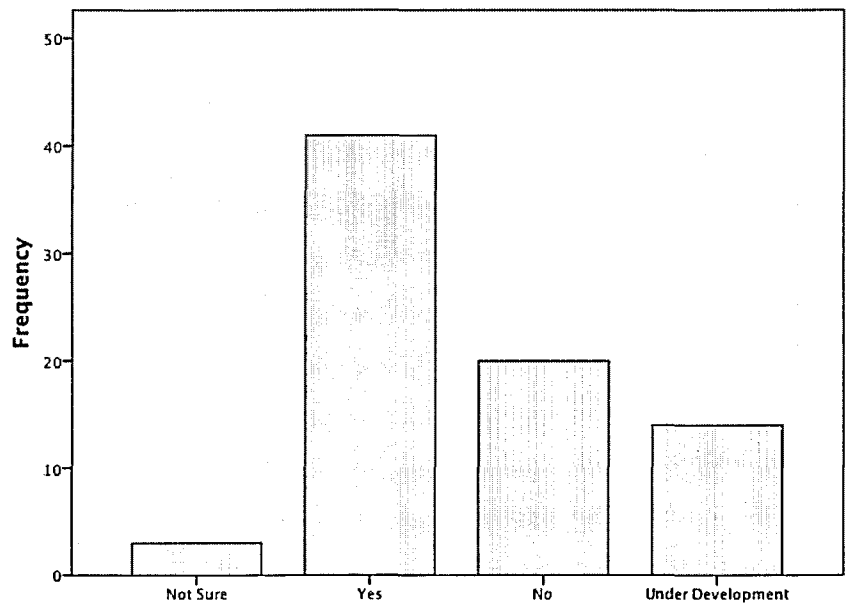
Figure 4.9: Incidence of SD Policies

Question 13: Focus of SD policies

Those respondents who indicated that their employer had or was developing a sustainable development policy were then asked to appraise the extent to which their organisation's policy reflected the social, economic and environmental sustainability. To achieve the primary purpose of the question, which was to evaluate the balance of sustainable development policies, the respondents were asked to evaluate the extent to which the policy adopted an *anthropo-centric* view of sustainability by allocating an indicative percentage to each dimension of sustainability based on the focus of their organisation's SD policy.

The results shown in Table 4.15 revealed that economic sustainability was given the highest priority, with a mean score of 33.60, although it also displayed the greatest variance, with a standard deviation of 23.712. Social sustainability generated a mean score of 27.52 and a standard deviation of 19.855. Finally, environmental sustainability recorded the lowest mean score (24.19), with the lowest level of variance, as indicated

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by the standard deviation of 16.917.

		Societal	Environmental	Economic
N	Valid	62	62	62
	Missing	16	16	16
Mean		27.52	24.19	33.60
Std. Deviation		19.855	16.917	23.712

Table 4.15: SD Policy Balance

The results shown in Table 4.15 are also presented as a series of graphs in Figures 4.10, 4.11 and 4.12, illustrating the normal distribution plot. The heavy skew to the left observed in each of the graphs suggests that the policies are focused towards the *anthropo-centric* view of sustainability:
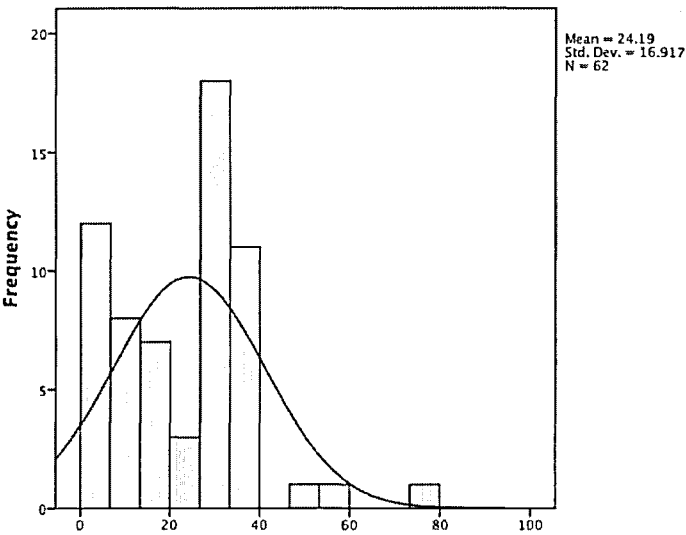
Figure 4.10: SD policy balance – Environmental
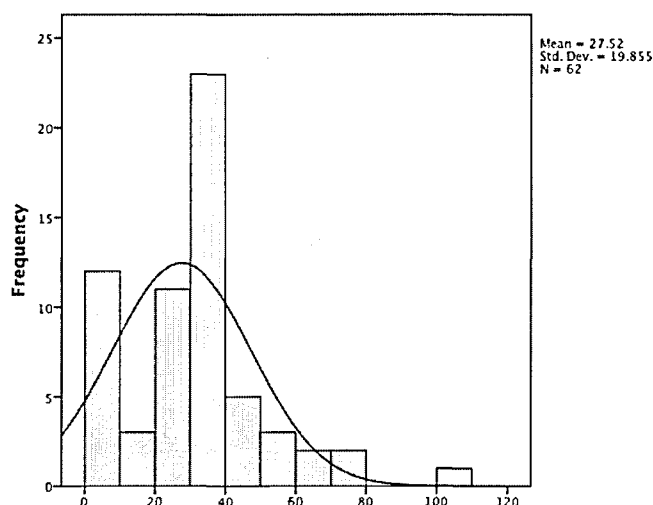
Figure 4.11: SD policy balance — Social
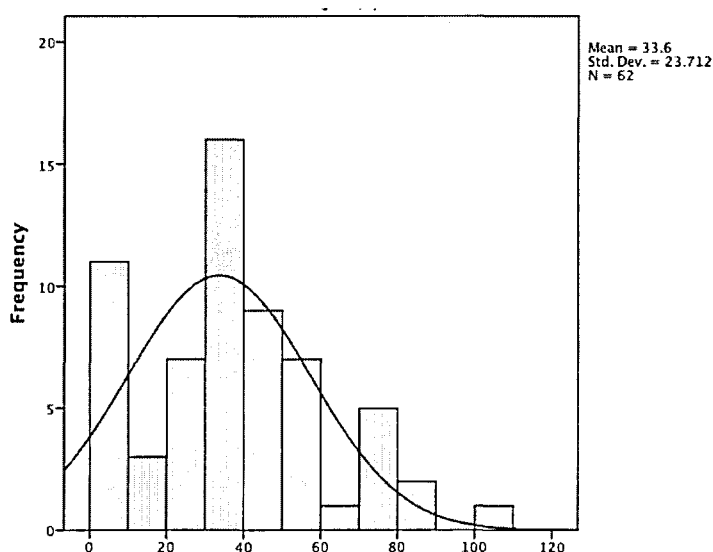
Figure 4.12: SD Policy Balance - Economic

Question 14: SD policy impact on project appraisal

The comprehensive survey of over 4,000 chartered surveyors, undertaken on behalf of the RICS by Dixon *et al* (2007), identified, *inter alia*, the lack of a corporate commitment to the delivery of sustainability as a barrier to the further implementation of sustainable development throughout the built environment. Carter and Fortune (2007) and Cooper and Jones (2008) both indicated that the existence of a 'sustainable development plan' within a social housing organisation constituted evidence of the effect of corporate leadership on the implementation of project related sustainability practices. Therefore, this survey collected data on the extent to which a corporate focus on sustainability, communicated via the existence of a sustainable development policy,

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influenced the toolkits that practitioners selected for use when appraising potential re-development schemes.

Using a five point likert scale, with the mid-range response being "*slight Influence*", those respondents who indicated that their organisation had a policy in place, or was currently developing one, were asked to appraise how such a corporate focus on sustainability was likely to influence their practice. The survey results shown in Figure 4.13 reveal that 72% of the respondents considered that the introduction of a strategic policy on sustainability had influenced the decision making within the organisation. These results show that the introduction of an organisational policy relating to sustainability positively influences the decision-making associated with early stage project evaluations to consider sustainability issues.
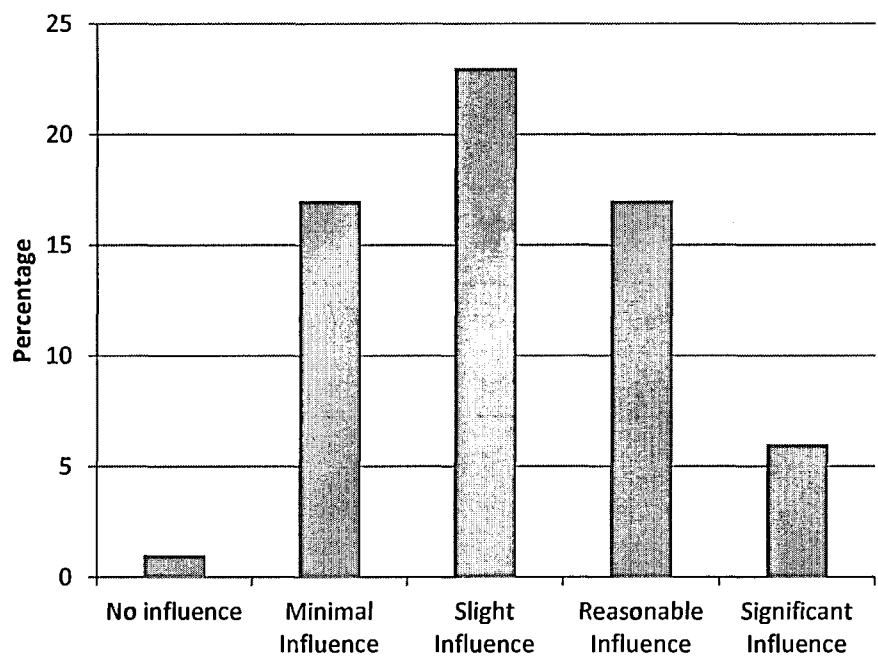
Figure 4.13: Influence of SD policy.

Question 15: Headline sustainability indicators relevant to project appraisal

The respondents were asked to consider a number of principal indicators of sustainability that Long and Hutchins' (2003) seminal work suggested to be important to housing projects. To assist in the appraisal of these dimensions of sustainability, the respondents were also asked to rate the importance of three standard indicators, namely design aesthetics, decent home compliance, stock condition and housing quality, which are adopted by practitioners in the sector as a matter of course. A likert scale was

adopted for the responses, which ranged from not relevant (0) to extremely important (5), as shown in Table 4.16.

	Features	No Response (0)	Little Relevance (1)	Slightly relevant (2)	Relevant (3)	Highly Relevant (4)	Critical (5)	Mean Rating	Std. Dev.
Traditional	Quality	0	12	9	15	35	7	3.21	1.231
	Condition Survey	0	0	6	2	24	46	4.33	1.101
	Decent Homes	0	10	4	10	39	15	3.58	1.233
	Aesthetics	0	12	12	27	23	4	2.94	1.132
	Other	33	0	4	11	25	5	2.13	1.930
Environmental	Energy efficiency	2	3	0	2	31	40	4.27	1.113
	Quality of Environment	2	5	0	5	43	23	3.94	1.166
	Other	42	1	4	7	20	4	1.67	1.918
Social	Reputation	0	8	6	9	38	17	3.64	1.206
	Crime / ASB	0	9	6	9	33	21	3.65	1.277
	Social Exclusion	0	10	4	9	33	22	3.68	1.294
	Access to services	0	8	4	10	29	27	3.81	1.259
	Cohesion	0	8	7	9	35	19	3.64	1.238
	Community mix	0	9	6	15	29	19	3.55	1.265
	Other	56	0	4	4	13	1	0.99	1.647
Economic	Demand	0	8	2	3	24	41	4.13	1.262
	Forecast demand	0	8	0	3	13	54	4.35	1.247
	Maintenance cost	0	7	0	2	29	44	4.37	1.008
	Life expectancy	0	7	0	2	22	36	4.17	1.113
	Other	68	1	0	1	3	5	0.53	1.448

Table 4.16: Ranking sustainability indicators

The rankings identified that factors including energy efficiency, asset life expectancy, condition survey and demand were seen as the most important, whereas those relating to more subjective indicators, including the quality of the existing housing, design aesthetics and the quality of the local environment (such as landscaping, play areas, etc), together with the various social dimensions identified from the literature, including crime, anti-social behaviour, the mix and cohesiveness of the community, and access to local facilities, were seen as less important.

Nonetheless, the results in Table 4.16 show that all the aspects of sustainability listed in the survey were important within the overall investment decision making process. This

indicates that practitioners working within the sector are aware of the need to incorporate the broader principles of social and economic inclusion into potential social housing refurbishment projects but that, at present, such broader issues of sustainability are less important. The results of this survey confirm that practitioners focus on the provision of low energy buildings when considering stock refurbishment as the principal way to deliver sustainable housing projects. These findings confirm the results of previous work by Hall and Purchase, (2006) and Essa and Fortune (2008), that the social housing sectors' engagement with sustainability focuses on the delivery of environmental sustainability in its social housing refurbishment projects.

Overview of Sustainability and Sustainable Development

It was surprising to find more than half of the respondents identified that their organisations did not have a sustainable development policy in place as part of their corporate social responsibility framework. Of equal surprise was the apparent stagnation in policy development observed when the findings are compared with those of Carter (2005) and Cooper and Jones (2008), suggesting that the sector's moves towards improving its engagement with sustainability has effectively stagnated. This finding adds significant weight to Carter and Fortune's (2007) assertion that the existence of a sustainable development policy within an organisation did not reflect the organisation's commitment to sustainability, but rather was reflective of the organisation's desire to comply with the funding criteria, one of which required them to have a sustainable development policy in place. However, the removal of this requirement in 2009 appears to correlate with the observed stagnation in policy development.

4.4.7 Analysis

Following the initial descriptive analysis of the data, it was resolved to undertake further inferential statistical analysis to establish if any of the observed relationships in the data were significant, whilst also allowing the researcher to draw conclusions from the sample about the wider population.

Generation of Hypotheses

In designing the survey, certain hypotheses were identified, as outlined below:

H_1: Organisations formed from stock transfers are more likely to be exposed to higher levels of low demand.

H_2: Organisations formed from stock transfers are more likely to operate within their own locality.

H_3: Larger, more established organisations have a higher propensity to invest in both new development and the refurbishment of existing stock.

H_4: Organisations formed from stock transfers have a higher propensity to refurbish existing stock.

H_5: Housing associations with low demand housing stock have a higher propensity to invest in the existing stock.

H_6: Organisational size will influence the section of feasibility toolkits, with larger organisations being more likely to implement value-orientated tools.

H_7: Larger organisations are more likely to have developed and implemented governance systems relating to sustainability.

H_8: Sustainable development policies are based on the attainment of weak sustainability, with the triple bottom line sitting at the core – providing equal emphasis on the environmental, economic and social dimensions.

H_9: Corporate governance relating to sustainability will have a strong influence on the adoption of value based appraisal frameworks, which emphasise the importance of wider benefits from investment.

When statistically testing hypotheses, Fellows and Liu (2008:127) assert that it is impossible to prove a hypothesis correct; it is only possible to establish whether the

hypothesis is to be rejected. As such, only the null hypotheses should be tested. Each of the nine hypotheses proposed have corresponding null hypotheses, which were examined.

When rejecting null hypotheses, Fellows and Liu (2008:91) advise researchers to be aware of the possibility of the test returning a false positive (type 1 error) or false negative (type 2 error). A type 1 error occurs if the researcher erroneously fails to reject the null hypothesis when it is true, whereas a type 2 error occurs if the researcher erroneously fails to reject the null hypothesis when it is false. The likelihood of performing a Type 1 or Type 2 error is related to the probability or significance level. Dancey and Reidy (2008:147) suggest that, with a P value of 0.05, there is still a 1 in 20 or 5% chance of an error occurring. However, as the significance level increases, the possibility of a statistical error occurring reduces. It is widely accepted in the Social Sciences that a P-value of 0.05 or less is considered significant, and that the null hypothesis is to be rejected despite the risk of statistical error (Dancey and Reidy, 2008).

Parametric or Non-Parametric Data

Calder and Sapsford (2006) opine that, when the results of quantitative research are reported, the data have often been subjected to a range of inappropriate statistical tests, leading to unreliable and misleading findings. It is of vital importance, therefore, to ensure that the most appropriate test or range of tests is carried out to ensure the validity of the analysis, the reported findings and, critically, the conclusions drawn.

Fellows and Liu (2008:194) highlight that statistical tests are generally classified as either 'parametric or non-parametric'. Parametric tests are regarded as yielding stronger, more reliable results than non-parametric ones (Field, 2013). However, before researchers can select parametric tests, they must ensure that their data conform to a number of underlying assumptions, including: the data are drawn from a normally distributed population, and therefore is itself normally distributed; the variances in the populations from which the data are drawn are approximately equal; and, finally the data do not include any statistical outliers or extreme scores (Dancey and Reidy, 2008: 154-155).

To appraise the data's suitability for parametric tests, it was first tested for normality. Normality is defined by the distribution of the data, with normally distributed data

characterised by a symmetrical, bell-shaped graph with a mean and median at the centre. The conventional test for data normality is the Kolmogorov-Smirnov goodness of fit test. However, Garth (n.d.) espouse that the Shapiro-Wilk test is more appropriate in situations where less than 2,000 items of data are collected. The Shapiro-Wilk test was subsequently applied to a range of questions to establish if the data was normally distributed. An example of the results for question 4 *number of dwellings* is presented in table 4.17. As table 4.17 shows the P-value for the Shapiro-Wilk test is 0.000. This implies that the data set is not normal as the P-value is clearly smaller than alpha = 0.05.

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	df	Sig.
Number of Dwellings	.184	78	.000	.851	78	.000

Table 4.17: Tests of Normality.

This can also be seen from the shape of the plot in the corresponding Q-Q-plots in Figure 4.14, that suggest that the data are not normal, as the plots deviate from the straight-line plot.
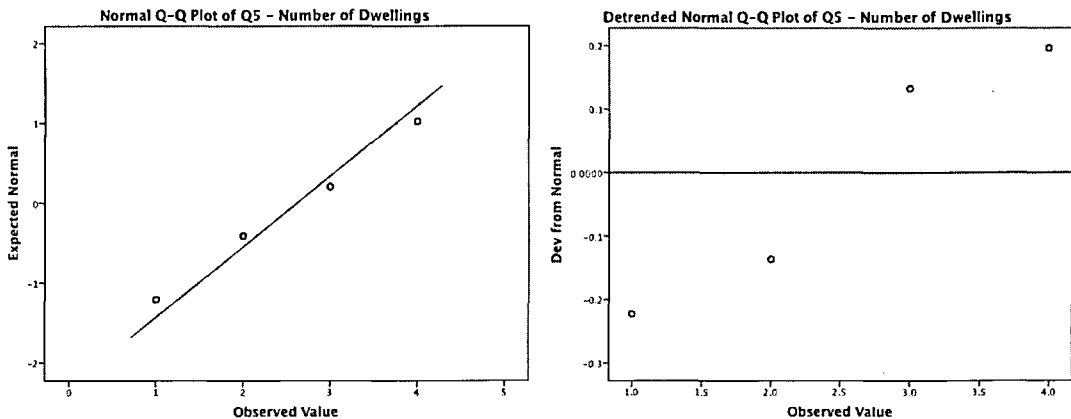
Figure 4.14: Normal Q-Q and De-trended Normal Q-Q plot for Number of Dwellings

The non-normal distribution means that parametric tests are unsuitable. As a result, non-parametric tests have been applied. Despite the fact that these tests are less powerful, they nonetheless facilitate the testing of the relationships and the strength of these, thus allowing inferences about the population to be drawn.

Respondent Characteristics

The initial appraisal of the data highlighted a number of potential relationships. Firstly, the data appeared to support the observation from the exploratory interviews, which suggested that a relationship existed between the age and chosen classification of social

housing organisations. Whereby older organisations would differentiate themselves from newer stock transferred organisations by retaining the *housing association* brand. The results of the descriptive analysis, shown in table 4.18, suggests that older organisations do appear to prefer the *housing association* title with 10 pre-1989 organisations opting for this title, whilst it was only adopted by only 5 of the post 2000 organisations.

	Not Given	Pre 1989	1989 - 1999	Post 2000	Total
Registered Social Landlord	2	19	9	15	45
Housing Association	5	10	6	5	26
ALMO	0	0	0	7	7

Table 4.18: Cross tabulation: organisation type by maturity

It was resolved to investigate whether this possible association was statistically significant. A null hypothesis was developed that predicted that there would be no significant relationship between the age of the organisation and the title chosen. A Chi-square test was conducted to establish if any significant relationship existed. The test results, shown in Table 4.19, revealed that a correlation exists between the maturity of an organisation and their selected branding (χ^2 (6) =19.631(two-tailed)), and the significance was less than 0.05 (p=<.01), indicating that the null hypothesis could be rejected, with the results showing that the maturity of the organisation does influence the title selected.

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	19.631	6	.003
Likelihood Ratio	21.058	6	.002
Linear-by-Linear Association	1.479	1	.224
N of Valid Cases: 78			

Table 4.19: chi-square test: organisational type and maturity

As a result, it was resolved further to examine the data to establish whether or not the organisations that had been formed as a result of the local authority housing stock transfer displayed a higher propensity to define themselves as *registered social landlords*. Again, the potential relationship was tested using a Chi-square test. The results, shown in Table 4.20, suggest that no statistically significant relationship existed (χ^2 (4)=7.583, *p0.11*(two-tailed)), showing that the organisations that were formed from a stock transfer are no more likely to adopt the RSL classification.

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	7.583	4	.108
Likelihood Ratio	10.193	4	.037
Linear-by-Linear Association	4.581	1	.032
N of Valid Cases: 78			

Table 4.20: Chi-square test: classification and origin of organisation

Hypothesis 1: Organisations formed from stock transfers are exposed to higher levels of low demand

The literature suggested that organisations formed as a result of a local authority housing stock transfer were more likely to exhibit significant levels of low demand. This view was reinforced by the exploratory interviews, during which one interviewee asserted that transferred housing was likely to exhibit the legacy effects of the use of socially engineered housing allocation systems. It was therefore resolved to examine if this potential relationship was statistically significant. A null hypothesis was developed that predicted that organisations formed from stock transfers were no more likely to exhibit low demand than any other social housing organisation. A Kendall's tau_b test was conducted to establish if any significant relationship existed. Despite the fact that the results, shown in Table 4.21, identified a positive correlation ($K=0.586$, $n=78$(two-tailed)), the significance exceeded 0.05 ($p=0.06$), suggesting that the null hypothesis could not be rejected. This allowed the work to conclude that organisations created through the transfer of local authority housing stock do not face higher levels of low demand stock.

			Stock Transfer	Percentage of stock in low demand
Kendall's tau_b	Stock Transfer	Correlation Coefficient	1.000	.063
				.586
		Sig. (2-tailed) N	78	78
	Percentage of stock in low demand	Correlation Coefficient	.063 .586	1.000
		Sig. (2-tailed) N	78	78

Table 4.21: Kendall's tau_b test: stock transfer and unpopular stock.

Hypothesis 2: Organisations formed from stock transfer are more likely to operate within their own locality

It had been suggested during the exploratory interviews that organisations emerging from stock transfer arrangements would often restrict their operations to their immediate locality. To test the reliability of these findings, it was resolved to establish whether, as suspected, those organisations created as a result of stock transfer arrangements restricted their operations to the immediate locality. A Kendall's tau_b test was again conducted to establish if any significant relationship existed. The results, shown in Table 4:22, identified a positive correlation (K=0.227, n=78(two-tailed)) with a significance of less than 0.05 (p=0.04), suggesting that the null hypothesis could be rejected. This confirmed that the organisations created as a result of local authority stock transfer do tend to restrict their operations to their immediate locality.

			Stock Transfer	Geographical Spread of stock
Kendall's tau_b	Stock Transfer	Correlation Coefficient	1.000	.227
				.038
		Sig. (2-tailed) N	78	78
	Geographical Spread of stock	Correlation Coefficient	.227	1.000
			.038	
		Sig. (2-tailed) N	78	78

Table 4.22: Kendall's tau_b test: stock transfer and geographical diversification

Table 4.23 shows that the majority of stock transfer organisations had been formed within the last 15 years. As a result, it was further resolved to establish if the maturity of the organisation influenced the results above. A Chi-square test was applied to the data, the result of which suggested that no significant relationship existed between the age and operational focus of the organisation ($\chi 2$ (6) = 11.245, p *0.081* (two-tailed)).

			Maturity			
		0	Pre 1989	1989 - 1999	Post 2000	Total
Stock Transfer	Yes	3	1	11	16	31
	No	4	28	4	10	46
	Not Sure	0	0	0	1	1

Table 4.23: Cross tabulation: Stock Transfer by maturity

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Asset Management Strategy

Despite the sizeable reductions in the affordable housing budget, social housing organisations have continued to raise capital on the private markets to invest in both new affordable housing and their existing stock. The analysis of the data reported in Section 5.4 provides evidence of the continued investment made by social housing organisations even though the investment levels have fallen away from those seen in 2005 (Carter, 2005). However, the analysis shows that the focus of investment has shifted over the same period, with a marked increase in the number of existing properties being refurbished or rehabilitated. As a result, it was resolved to appraise how organisational demographics have influenced the propensity to invest in either development or refurbishment.

Hypothesis 3: Larger, more established organisations have a higher propensity to invest in new development and refurbishment

A visual inspection of the data suggested that, whilst investment in housing stock remains a corporate goal for most respondent organisations, Carter (2005) concluded that was probably influenced by the size of the organisation. To appraise the veracity of this view, a null hypothesis was developed that predicted that there would be no significant relationship between the size of the organisation and its propensity to invest. A series of Kendall's tau_b tests were applied to the data related to both the levels of new housing development and the investment in the existing assets owned by the organisation to test the null hypothesis. The results, shown in Table 4.24, revealed that a moderate, positively correlated relationship existed between the size of the organisation and its propensity to invest in new development over the three financial years included in the survey.

			Nr of dwellings	Previous year	Survey year	Following year
Kendall's tau_b	Nr of dwellings	Correlation Coefficient	1.000	.286	.336	.381
		Sig. (2-tailed)		.002	.000	.000
		N	78	75	74	73
	Previous year	Correlation Coefficient	286	1.000	.699	.227
		Sig. (2-tailed)	.002		.000	.000
		N	75	75	74	73
	Survey year	Correlation Coefficient	.336	.699	1.000	.702
		Sig. (2-tailed)	.000	.000		.000
		N	74	74	74	73
	Following year	Correlation Coefficient	.381	.646	.702	1.000
		Sig. (2-tailed)	.000	.000	.000	
		N	73	73	73	73

Table 4.24: Kendall's tau_b test: New development and organisation size

Similarly, the results shown in Table 4.25 suggest that a moderately strong, statistically significant relationship existed between the size of the organisation and its propensity to invest in the existing stock over the same three financial years. Therefore, the null hypothesis can be rejected. As such, the work is able to confirm Carter's (2005) assertion and conclude that the size of the organisation does influence their willingness both to rehabilitate the existing stock and develop new housing.

			Nr of dwellings	Previous year	Survey year	Following year
Kendall's tau_b	Nr of dwellings	Correlation Coefficient	1.000	.250	.254	.224
		Sig. (2-tailed)		.008	.007	.018
		N	78	72	71	71
	Previous year	Correlation Coefficient	.250	1.000	.814	.769
		Sig. (2-tailed)	.008		.000	.000
		N	72	72	71	71
	Survey year	Correlation Coefficient	.254	.814	1.000	.862
		Sig. (2-tailed)	.007	.000		.000
		N	71	71	71	71
	Following year	Correlation Coefficient	.224	.769	.862	1.000
		Sig. (2-tailed)	.018	.000	.000	
		N	71	71	71	71

Table 4.25: Kendall's tau_b test: refurbishment investment and organisation size

Hypothesis four also suggested that more established organisations would display a greater propensity to invest in both new housing and the rehabilitation of the existing stock. The researcher therefore sought to appraise the relationship between the age of the organisation and their propensity to invest again in both the existing stock and new development. A series of Chi-square tests were applied to the data to test the null hypothesis. The results suggest that no statistically significant relationship exists between the age of the organisation and investment in new development projects over the three financial years considered by the survey 2011: χ^2 (108) = 121.496, p 0.177 (two-tailed); 2012: χ^2 (96) = 94.601, p 0.521 (two-tailed) and finally proposed for 2013 χ^2 (105) = 114.711, p 0.243 (two-tailed)), meaning that the null hypothesis cannot be rejected.

Further, the test did not reveal any statistically significant relationships between the age of the organisation and its propensity to invest in the existing stock with the data for 2011 (χ^2 (90) = 110.009, p 0.075 (two-tailed)) or for the projected investments for the 2013/14 financial year (χ^2 (75) = 76.727, p 0.423 (two-tailed)) revealing any statistically significant relationship. However, data for the 2012/13 financial year revealed a statistically significant relationship (2012 (χ^2 (87) = 112.088, p 0.036 (two-tailed)). The null hypothesis cannot be rejected, as the results are inconclusive.

Hypothesis 4: Organisations formed from stock transfers have a higher propensity to refurbish

An analysis of the survey data suggested that, whilst most social housing providers continue to see the provision of new affordable housing for sale or rental as a priority, investment focused on the existing stock remained a key corporate goal for most of the respondents'. However, it was opined by the senior professionals interviewed as part of the research and reported in a subsequent conference paper (Higham and Fortune, 2011) that organisations formed as a result of a stock transfer would exhibit a higher propensity to concentrate their investment in the existing stock, due to a combination of a legacy of under-investment and the urgent need to enhance the stock's commercial viability. The researcher therefore sought to establish whether a relationship existed between the organisation's origin and its propensity to undertake refurbishment work.

A series of chi-square tests were conducted on the three years of investment data to establish if any significant relationship existed. Looking at the actual investment for the financial years 2010/11 (χ^2 (60) = 45.816, p 0.912 (two-tailed)) and 2011/12 (χ^2 (58) =

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48.080, *p 0.820* (two-tailed)), no statistically significant correlation was identified. Conversely, when the focus transferred to the forecast investment for 2012/13 (χ^2 (50) = 98.707, *p <0.01* (two-tailed)), a statistically significant correlation was discovered. To examine the strength of this correlation, a Cramer's V test applied. The value of the coefficient (V=0.834) revealed a strong association between an organisation's propensity to refurbish and its origin, suggesting that the null hypothesis can be rejected, and allowing the researcher to conclude that stock transfer organisations do exhibit a greater propensity when planning future asset investment, suggesting that the null hypothesis cannot be rejected.

Hypothesis 5: Housing associations with low demand stock exhibit a higher propensity to invest in the existing stock

During the early 2000s, the labour government channelled significant funding into the HMR Fund with the aim of transforming pockets of socially excluded housing. Given the importance of this agenda together with the lasting legacy discovered during the exploratory interviews, it was hypothesised that social housing organisations with a significant percentage of difficult to let housing would exhibit a higher propensity to invest in stock regeneration projects. To test this hypothesis, the percentage of low demand stock held by the respondents' organisations was correlated with the indicated refurbishment investment for the financial years 2010/11 to 2012/13. The results of a series of chi-square tests, shown in Table 4.26, reveal, without exception, that those organisations with a higher concentration of low demand stock do not exhibit a greater propensity to invest, suggesting that the null hypothesis cannot be rejected.

| | | Refurbishments | |
Year	Value	df	Asymp sig. (2-sided)
2011	120.260	120	.476
2012	104.176	116	.776
2013	70.683	100	.988

Table 4.26: Chi-square test: low demand stock and refurbishment investment 2011-2013

Selection and Use of Appraisal Toolkits

Whilst over 90% of the respondents identified that they were undertaking some level of refurbishment, Table 4.14 evidenced a very clear trend towards the use of traditional, economically focused tools for the evaluation of potential projects. However, the

exploratory interviews evidenced a different range of views from practising experts, with the results suggesting that newer organisations exhibit a greater propensity to adopt toolkits which evaluate projects from an increasingly value focused prospective. It was therefore resolved further to explore this discrepancy, and enhance the understanding of toolkit selection within the social housing sector. Statistical tests were applied to the data, to explore the significance of three potential indicator variables identified from the exploratory interviews.

Organisational Maturity

During the exploratory interviews, it became apparent that the older organisations employed a larger number of highly specialised staff whilst also exhibiting a stronger understanding and awareness of the commercial environment within which investment decisions were made, resulting in a strong bias towards the appraisal of a scheme's economic merit. To test the relationship between organisational age and tool selection, a chi-square test was applied to each project appraisal technique identified from the literature. The results are presented in Table 4.27.

For the majority of the results, no statistically significant relationship was identified between the maturity of the organisation and the use of that specific technique, suggesting that the null hypothesis that older organisations were no more likely to adopt financial toolkits cannot be rejected. Yet, the results revealed that, rather than appraising the commercial viability of a project based on the initial capital outlay, the more established organisations sought to appraise viability over the expected life of the asset, with the Chi-square test revealing a statistically significant relationship between the use of life cycle modelling and organisational maturity ($\chi^2(9)$=17.089, *p=0.047* (two-tailed)). However, testing the strength of this association using a Cramer's V test revealed only a weak association between the two variables (V=0.270).

Of more surprise is the statistically significant correlation revealed between the age of the organisation and the use of cost benefit appraisals ($\chi^2(9)$ =18.632, *p=<0.029* (two-tailed)) although, when the strength of this association was evaluated using a Cramer's V test, the value of the coefficient suggested that this association is again weak (V=0.282). The results nevertheless suggest that the more traditional organisations evaluate the benefits offered by various levels of investment.

| Framework | Chi-Square | | |
	Value	df	Asymp sig. (2-sided)
Cost Planning	9.303	9	.410
Life Cycle Models	17.089	9	.047
Present Value	11.264	9	.258
Internal rate of return	14.784	9	.097
Social Return	5.777	9	.762
Cost Benefit Analysis	18.632	9	.029
Social capital models	12.015	9	.212
P.R.I.S.M	5.975	6	.426
Social Impact Studies	9.799	9	.367
Ecohomes XB	6.685	9	.670
NHF Guidance Model	7.646	9	.570
Bespoke System (Self developed)	6.978	12	.859
Commercial system	11.134	9	.267

Table 4.27: Chi-square test: Tool selection and organisation maturity.

Hypothesis 6: Organisational size will influence the section of feasibility toolkits, with larger organisations being more likely to implement value-orientated tools

It was suggested, based on a combination of the literature and exploratory interviews, that larger organisations with more resources are leading the innovation in the sector. To test this possibility, it was hypothesised that larger organisations would show a greater propensity to adopt more holistic project appraisal techniques. A Chi-square test was conducted to establish if any relationship existed between the size of the organisation and the tools used to assess the feasibility of projects.

The results of the Chi-square test, shown in Table 4.28, revealed relationships between the size of the organisation and all of the identified tools, although only the correlation between *cost planning* and *organisational size* was statistically significant (χ^2 (9) = 18.488, *p 0.03* (two-tailed)). Again, a Cramer's V test was applied to evaluate the strength of the association. The value of the coefficient suggested that the association was weak (V=0.270). Overall, the results show that organisational size does not influence the selection of feasibility toolkits, and the null hypothesis, suggesting that organisational size does not influence the adoption of value based toolkits, cannot be rejected.

Framework	Chi-Square			
	Value	Df	Asymp sig. (2-sided)	
Cost Planning	18.488	9		.030
Life Cycle Models	4.795	9		.852
Present Value	11.350	9		.252
Internal rate of return	10.062	9		.345
Social Return	15.784	9		.072
Cost Benefit Analysis	13.340	9		.148
Social capital models	11.399	9		.249
P.R.I.S.M	7.045	6		.317
Social Impact Studies	8.742	9		.461
Ecohomes XB	13.822	9		.129
NHF Guidance Model	11.402	9		.249
Bespoke System (Self developed)	10.900	12		.537
Commercial system	6.592	9		.680

Table 4.28: Chi-square test: Tool selection and organisation size.

Sustainability and Sustainable Development Strategies

The drive for both sustainable homes and sustainable communities has been a top policy priority since the launch of the Sustainable Communities Plan in 2003 and was reinforced under the terms of the Sustainable Communities Act in 2008. As such, social housing projects are regarded as leading the way in terms of embedding sustainability. Yet, only 54.67% of the 78 organisations responding to the survey have introduced sustainable development policies as part of their corporate governance.

As Table 4.29 shows, when the results were further evaluated, 55.6% of RSLs, 50.1% of HAs and 42.9% of ALMOs suggested that they had a policy in place at the time of the survey. Conversely, 20% of RSLs and 28% of ALMOs revealed that they were looking to implement a sustainable development policy in the near future. In light of the results, a Cramer's V test was conducted to establish if any significant relationship existed between organisational type and the existence of a sustainable development policy. The results, shown in Table 4.29, revealed a low association between the variables (V=0.141) and that the significance was more than p=0.05, suggesting that the null hypothesis could not be rejected, and reaffirming the initial observation that no relationship exists between organisational types and the existence of sustainable development policies.

		SD Policy				Total
		Yes	No	Under development	No Response	
RSL's	Count Expected count % of total	25 23.7 55.6%	9 11.5 20.0%	9 8.1 20.0%	2 1.7 4.4%	45 45.0 100%
HA's	Count Expected count % of total	13 13.7 50.1%	9 6.7 34.6%	3 4.7 11.5%	1 1.0 3.8%	26 26.0 100%
ALMOs	Count Expected count % of total	3 3.7 42.9%	2 1.8 28.6%	2 1.3 28.6%	0 0.0 0.0%	7 7.0 100%
Statistics		Value	Approx. Sig.			
Nominal by Nominal	Phl Cramer's V Contingency coefficient	.199 .141 .195	.798 .798 .798			
N of valid cases		78				

Table 4.29: *Cramer's V test: organisation's classification and SD policy.*

Hypothesis 7: Larger organisations are more likely to have developed and implemented governance structures relating to sustainability

A null hypothesis was developed that predicted that there would be no significant relationship between the implementation of a sustainable development policy and the size of the organisation. Of the 17 respondents with less than 1,000 units, only 35.3% had a sustainable development policy in place, whereas 52.2% of the respondents with stocks of more than 10,000 properties had a sustainable development policy. These results show that the size of the organisation influences the development of corporate policy instruments relating to sustainable development, with larger organisations most likely to have developed such policies. It was resolved to investigate this using a Cramer's V test to establish whether this possible association was statistically significant, given that those organisations in the mid-range bands ($<$ 5,000 units and 5,001 to 10,000 units) displayed a greater propensity to implement such policies than the largest organisations in the sample. The results revealed a modest association between the variables (V=0.400), although its significance was more than 0.05 (p=0.18) suggesting the null hypothesis cannot be rejected, indicating that the observed relationship occurred by chance and was not reflective of the wider population.

		SD Policy				Total
		Yes	No	Under development	No Response	
<1000	Count Expected count % of total	6 8.9 35.3%	8 4.4 47.1%	3 3.1 17.7%	0 0.7 0.0%	17 17.0 100%
1001-5000	Count Expected count % of total	11 10.0 57.9%	6 4.9 31.6%	1 3.4 5.3%	1 0.7 5.3%	19 19.0 100%
5001-10000	Count Expected count % of total	12 10.0 63.2%	3 4.9 15.8%	4 3.4 21.1%	0 0.7 0.0%	19 19.0 100%
>10,000	Count Expected count % of total	12 12.1 52.2%	3 5.9 13.0%	6 4.1 26.1%	2 0.9 8.7%	23 23.0 100%

Statistics		Value	Approx. Sig.			
Nominal by Nominal	Phl	.400	.188			
	Cramer's V	.231	.188			
	Contingency coefficient	.371	.188			
N of valid cases		78				

Table 4.30: Cramer's V test: organisation size and SD policy

Organisational maturity

Finally, the data were analysed to establish if the maturity of the organisation influenced the development of sustainable development policies. Table 4.31 illustrates a cross tabulation of the two variables: *maturity* and *SD policy*.

		SD Policy				Total
		Yes	No	Under development	No Response	
No Response	Count	4	2	1	0	7
	Expected count	3.7	1.8	1.3	0.3	7.0
	% of total	57.1%	28.6%	14.3%	0%	100%
Pre-1989	Count	14	9	4	2	29
	Expected count	15.2	7.4	5.2	1.1	29.0
	% of total	48.3%	31.0%	13.8%	6.9%	100%
1989-1999	Count	10	2	3	0	15
	Expected count	7.9	3.8	2.7	0.6	15.0
	% of total	66.7%	13.3%	20.0%	0.0%	100%
Post 1999	Count	13	7	6	1	27
	Expected count	14.2	6.9	4.8	1.0	27.0
	% of total	48.1%	25.9%	37.0%	3.7%	100%
Statistics		Value	Approx. Sig.			
Nominal by Nominal	Phl	.233	.896			
	Cramer's V	.134	.896			
	Contingency coefficient	.227	.896			
N of valid cases		78				

Table 4.31: Cross tabulation: organisation maturity and SD policy.

The results indicate that no relationship exists, with 48.3% of the organisations founded before 1989 having a sustainable development policy, 66.7% of those formed between 1989 and 1999, and 48.1% of those formed after 2000. Once again a Cramer's V test was conducted to establish if any significant relationship existed between the maturity of the organisation and the existence of a sustainable development policy. The value of the coefficient revealed a weak association (V=0.233) and the significance is more than 0.05 (p=0.90). Consequently, despite the existence of a weak relationship, it is not statistically significant and the null hypothesis cannot be rejected.

Hypothesis 8: Sustainable Development policies are based on the attainment of weak sustainability with the triple bottom line sitting at the core – providing equal emphasis on the environmental, economic and social aspects of sustainability

It has been suggested in the literature (ODPM, 2003; Egan, 2004; DEFRA, 2005) that, for sustainable communities to be delivered, social housing providers need to ensure that the social, environmental and economic dimensions of sustainability are in equilibrium, whereby equal merit is given to each feature of sustainability. To appraise the extent to which this is achieved in practice, the respondents were asked to indicate the approximate balance of their policy by allocating percentages to each of the three headline dimensions of sustainability:
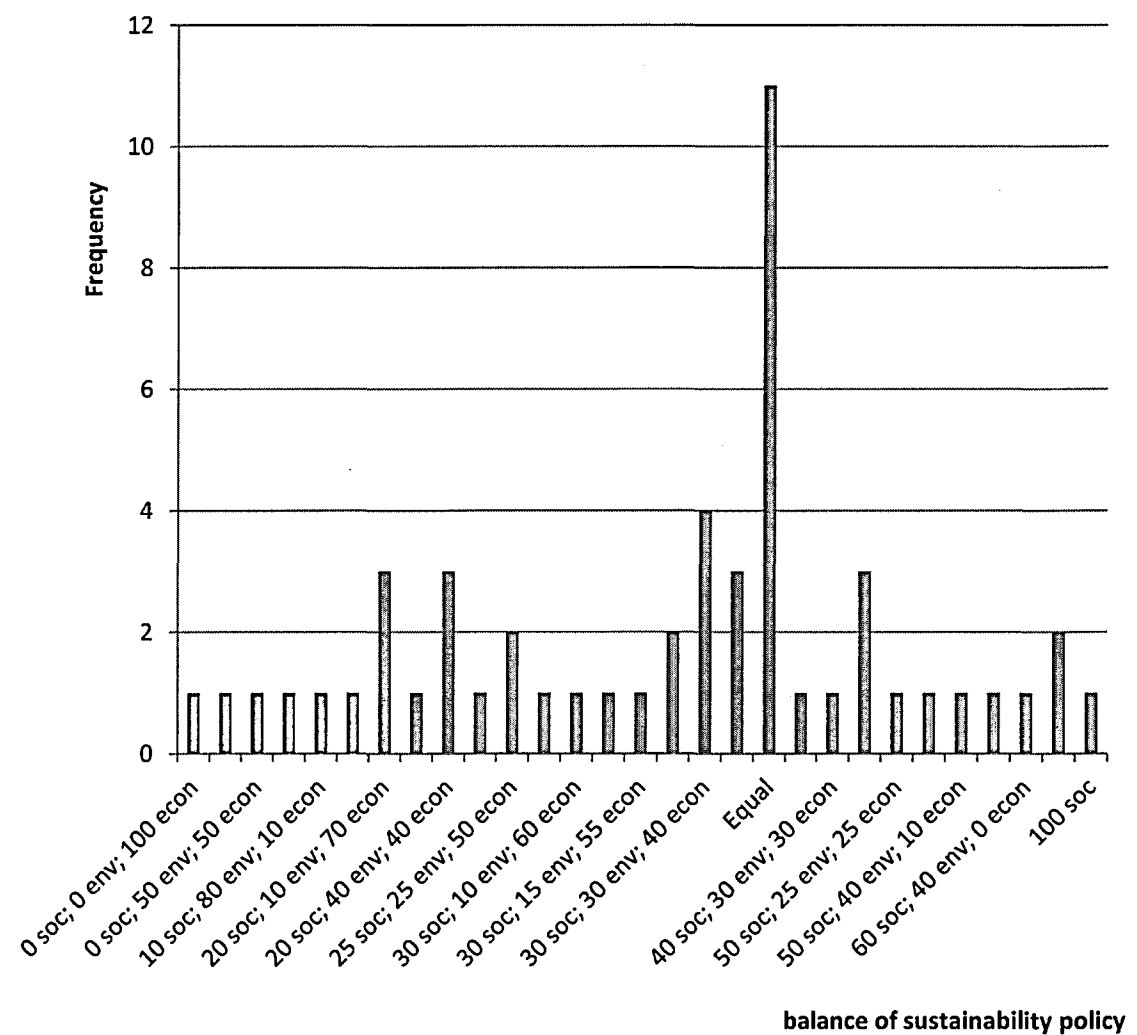
Figure 4.15: Range of sustainable development policy ratios

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Figure 4.15 shows that, whilst a balanced policy is by far the most common, a number of respondents identified that their organisation's sustainable development policy deviated from this ideal, with extreme examples, only considering one of the three dimensions of sustainability.

Due to the large number of permutations identified, it was decided to recode the variable to allow a better comprehension of the results. The recoding process started with the percentages allocated by the respondents and transformed these into a three digit number. Therefore, if someone suggested that their policy was equally balanced (33-33-33), this is coded as 333; a score of 70-30-20 becomes 732, and so on. In some instances, weightings such as 25-25-50 are evident, in which case the fractional data are rounded off to the nearest integer, and this would be coded 3-3-5.

The data were then organised into three categories: *balanced*; *slight emphasis* and, finally, *strong emphasis* to depict the policy's balance, whereby *Balanced* indicated an equal scoring across the three dimensions of sustainability; *Slight emphasis* represented scores plus or minus one away from balanced i.e. 432 or 324; and *strong emphasis* represented scores two or more in either direction away from a balanced policy i.e. 531 or 711.
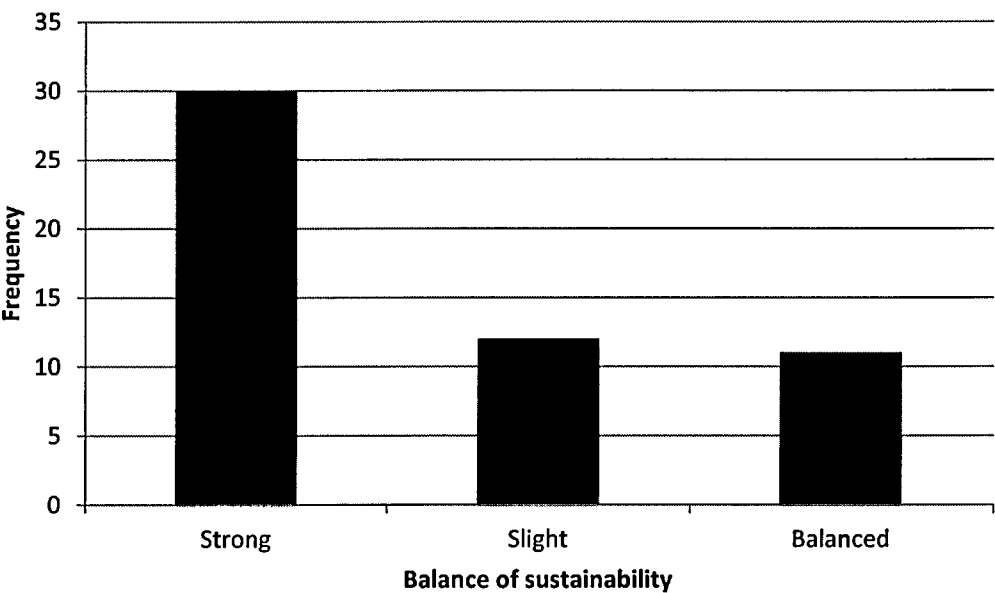
Figure 4.16: Balance of SD policies

As Figure 4.16 shows, organisations with a balanced policy represented 57% of the total, whilst those that placed a slight emphasis on any one specific aspect of

sustainability accounted for 22%. Those organisations placing a strong emphasis on any one dimension of sustainability accounted for the final 21%. As a result, the null hypothesis cannot be rejected, as it is clear from the data that the balanced approach, promoted by policy makers and housing agencies, has not being implemented in practice.

It was however resolved to establish if any relationship existed between the balance of the policy and the maturity of the organisation. A null hypothesis was developed that predicted that there would be no significant relationship between the balance of the policy and the maturity of the organisation. A Kendall's tau_b test was conducted to establish if any significant relationship existed. As Table 4.32 shows, the test revealed a small negative correlation (K=-0.122, n=48 (two-tailed)) which was not significant (p=0.33) and so the null hypothesis cannot be rejected, suggesting that organisational maturity does not influence the balance of the SD policy.

		SD Policy Balance			Total
		Strong Emphasis	Slight Emphasis	Balanced Emphasis	
Unclassified	Count	2	2	1	5
	Expected count	2.5	1.4	1.1	5.0
	% of Total	4.2%	4.2%	2.1%	10.4%
Pre 1989	Count	9	1	6	16
	Expected count	8.0	4.3	3.7	16.0
	% of Total	18.8%	2.1%	12.5%	33.3%
1989 – 1999	Count	3	6	2	11
	Expected count	5.5	3.0	2.5	11.0
	% of Total	6.3%	12.5%	4.2%	22.9%
Post 2000	Count	10	4	2	16
	Expected count	8.0	4.3	3.7	16.0
	% of Total	20.8%	8.3%	4.2%	33.3%
		Value	Approx. T(b)	Approx. Sig.	
Ordinal by Ordinal	Kendall's tau_b	-.122	-.970		.332

Table 4.32: Kendall's tau_b test: SD policy balance and organisation maturity

Finally, the data were analysed to appraise whether the size of the organisation impacted on the balance of the SD policy. A null hypothesis was proposed that predicted that there would be no significant relationship between the balance of the policy and the size of the organisation. Once again, a Kendall's tau_b test was conducted to establish if any significant relationship existed. As Table 4.33 shows, the test revealed a small positive correlation (K=-0.032, n= 48(two-tailed)) which was not significant (p=0.80) and so the null hypothesis cannot be rejected, suggesting that organisation size does not influence the balance of the SD policy.

		SD Policy Balance			Total
		Strong Emphasis	Slight Emphasis	Balanced Emphasis	
<1000	Count	5	1	2	8
	Expected count	4.0	2.2	1.8	8.0
	% of Total	10.4%	2.1%	4.2%	16.7%
1001-5000	Count	5	4	2	11
	Expected count	5.5	3.0	2.5	11.0
	% of Total	10.4%	8.3%	4.2%	22.9%
5001-10000	Count	7	4	4	15
	Expected count	7.5	4.1	3.4	15.0
	% of Total	14.6%	8.3%	8.3%	31.3%
>10,000	Count	7	4	3	14
	Expected count	7.0	3.8	3.2	14.0
	% of Total	14.6%	8.3%	6.3%	29.2%
		Value	Approx. T(b)	Approx. Sig.	
Ordinal by Ordinal	Kendall's tau_b	.032	-.251		.802

Table 4.33: Kendall's tau_b test: SD policy balance and organisation size

No matter how the policy is balanced, in the majority of cases, the three dimensions of sustainability are in competition with each other. Statistical investigation into the way in which the respondents sacrifice one aspect in favour of another allows us to understand the strength of relationship between the dimensions of sustainability. A series of Kendall tau_b tests, shown in Table 4.34, were conducted to establish if any significant relationships existed.

The results revealed a modest positive correction (K=-0.316, n= 62(two-tailed)) between *social and environmental* which was significant (p=<0.00), together with a modest negative correction (K=-0.231, n=62(two-tailed)) between *social and economic* sustainability, which was also significant (p=0.02). Finally, the Kendall tau_b test revealed a slight negative correlation (K=-0.069, n=62(two-tailed)) which was not significant (p=0.47) between the *economic* and *environmental* dimensions of sustainability.

As expected, the correlations between *social* and *economic* sustainability and between *economic and environment* sustainability were negative, evidencing that sacrifices are made between these dimensions of sustainability. However, surprisingly, a positive correlation between *social* and *environmental* sustainability was revealed, suggesting that both are equally important within the policy and that one cannot be sacrificed in favour of the other.

			Social	Environ.	Econ
Kendall's tau_b	Social	Correlation Coefficient	1.000	.316**	-.231*
		Sig. (2-tailed)	.	.001	.016
		N	62	62	62
	Environ.	Correlation Coefficient	.316**	1.000	-.069
		Sig. (2-tailed)	.001	.	.468
		N	62	62	62
	Econ	Correlation Coefficient	-.231*	-.069	1.000
		Sig. (2-tailed)	.016	.468	.
		N	62	62	62

Table 4.34: Kendall's tau_b test: Relationship between the principle dimensions of sustainability.

Hypothesis 9: Corporate governance relating to sustainability in social housing organisations will have a strong influence on the adoption of value based appraisal frameworks

Previous survey work by Dixon *et al* (2007) identified that a lack of a corporate commitment to the delivery of sustainability was a barrier to the implementation of sustainable construction principles. Carter and Fortune (2007) and Cooper and Jones (2008) both indicated that the existence of a 'sustainable development plan' within a social housing organisation provided evidence of the effect of corporate leadership on the implementation of project-related sustainability practices.

Therefore, this survey collected data on the extent to which a corporate focus on sustainability, communicated via the existence of a sustainable development policy, influenced the toolkits that practitioners selected for use when appraising potential re-development schemes. The results reported earlier show that the introduction of an organisational policy relating to sustainability positively influences the decision-making process, prompting built environment professionals to consider sustainability issues as part of the project appraisal. It was therefore resolved to investigate whether this possible association was statistically significant. A null hypothesis was developed that predicted that there would be no significant relationship between the implementation of an SD policy and the adoption of sustainable project appraisal tools. A series of Chi-square tests were conducted to establish if any significant relationships existed, the results of which are shown in Table 4.35. Unsurprisingly, the tests revealed a weak correlation (χ^2=0.314) with a significance of less than 0.05 (p=<0.01) between the use of life cycle costing, a technique strongly associated with environmental sustainability, and the introduction of a sustainable development policy.

On the other hand, the results revealed that, rather than transitioning the organisation towards value based project evaluations, the introduction of a sustainable development policy reinforced the use of traditional, financially focused, techniques, with the tests revealing statistically significant relationships for cost planning (χ^2 (9) = 17.355, p 0.4 (two-tailed)); present value appraisals (χ^2 (9) = 17.931, p 0.04 (two-tailed)); and internal rate of return (χ^2 (9) = 20.301, p 0.02 (two-tailed)). Of far more concern was the lack of statistically significant relationships between the various frameworks identified from the literature which had been developed to allow the sustainability of potential projects to be appraised. Although a statistically significant relationship was identified for the bespoke project feasibility models (χ^2 (12) = 22.259, p 0.04 (two-tailed)), the researcher was unable to determine the exact nature of such tools or the extent to which sustainability features in the appraisal of potential projects.

Toolkit	Chi-Square		
	Value	df	Asymp sig. (2-sided)
Cost Planning	17.355	9	.043
Life Cycle Models	23.066	9	.006
Present Value	17.931	9	.036
Internal rate of return	20.301	9	.016
Social Return	11.144	9	.266
Cost Benefit Analysis	10.237	9	.332
Social capital models	13.417	9	.145
P.R.I.S.M	3.720	6	.715
Social Impact Studies	6.692	9	.669
Ecohomes XB	3.839	9	.922
NHF Guidance Model	4.670	9	.862
Bespoke System (Self developed)	22.259	12	.035
Commercial system	11.508	9	.242

Table 4.35: Chi-square test: tools and SD policy.

4.5 Chapter Summary

The exploratory research suggests that professionals working in the social housing sector are far more in-tune with sustainability generally than was originally suspected. It has to be acknowledged that the data collection undertaken in the social housing sector is not yet generalisable and, as such, it cannot be argued to be robust. However, the findings of the exploratory interviews concur with the earlier work evident in the literature (Carter and Fortune, 2002; Cooper and Jones, 2009). The research indicated that a desire exists within the social housing sector to embed the three high level criteria associated with sustainability within their practices. Yet, attempts to integrate sustainable benefit planning into the decision process requires further refinement, as no apparent tool yet exists to facilitate this process following the removal of the sustainability toolkit commissioned by the Housing Corporation.

The large scale survey confirmed the findings from the exploratory interviews, thus enhancing the reliability of the data whilst also providing important mapping of the state of the art. The results from this chapter have established the UK social housing sector's commitment to sustainability, together with the existence of a clear desire, in most cases, to transition from a cost to a value based approach to project appraisal. Yet, the capturing of the existing project evaluation methodologies suggests that none of the existing frameworks identified in the literature are being used in practice, suggesting the calls from academia for a paradigm shift towards the general evaluation of social housing interventions based on multiple attributes rather than solely on economic merit has not yet been answered.

These findings add further weight to Brandon and Lombardi's (2011:25) assertion that most of the more holistic toolkits available for the assessment of multiple variables linked to sustainability are "*either incomplete or totally unstructured*". In either case, they assert their application to be impossible, reinforcing the need for a sustainable benefit evaluation framework for use by built environment professionals working in the social housing sector.

Chapter 5 Identifying Sustainability Indicators for Social Housing Asset Management Projects

5.1 Introduction

The exploratory interviews and large scale survey, triangulated with the literature review, confirmed the existence of a gap in knowledge. The results evidence that, whilst the social housing sector exhibits a strong propensity to embed the principles of sustainability into practice, the existing frameworks for the evaluation of sustainability are, as suspected, incomplete or unsuitable for application within the sector, thus confirming the need for the research reported in this thesis.

This chapter presents the initial stage of the second phase of the research. Working with one enlightened, yet typical social housing organisation operating in the North West of England, the research sought to develop a conceptual framework for the evaluation of sustainable benefit. To achieve this aim, the researcher needed to identify the decision criteria or project centric sustainability attributes which would need to be evaluated if benefit is to be delivered to the community and, ultimately, the policy requirement of delivering and enhancing sustainable communities are to be attained.

5.2 Theoretical Indicators of Sustainable Development for Social Housing Projects

"A truly holistic integrated methodology is likely to incorporate features from many of the existing approaches". (Pearce 2007:16)

Alkire (2008) suggests that the process of developing a list of sustainability indicators must start by engaging with *all* the relevant literature. There has been considerable activity in the development of frameworks for the implementation of sustainability within the built environment, and specifically in relation to the delivery of sustainable construction projects. This literature forms an important element in the professional and disciplinary background of researchers and practitioners involved in the delivery of buildings. Amongst this body of published material are a number of seminal works, policy documents and doctorial theses which aimed to identify the key characteristics of sustainability in relation to housing projects. Through the proposal of theoretical

frameworks and policy rhetoric, this body of work attempted to guide construction activity towards the attainment of the goal of sustainability through increasing the levels of sustainable development.

One of the aims of the research was to establish the features of sustainability apparent at both practice and policy levels. To commence this process, the nine policies and framework documents shown in table 5.1 developed as the result of public consensus, resulting from intensive consultation exercises in the case of policy literature or high level reasoning, in the case of academic literature. The ten seminal works were selected because of their relevance to or influence on the social housing sector. Each document was subsequently analysed to develop a theoretical model.

Influential Policy and Framework Documents
1. Hill and Bowen's (1997) list of 26 project level sustainable construction indicators.
2. The UK Housing Corporation's Toolkit of 49 indicators of sustainable communities (Long and Hutchins, 2003).
3. The Audit Commission's (2003) List of Local Quality of Life Indicators.
4. The UK National Housing Federation's list of 86 indicators for sustainable neighbourhoods (Treanor and Walker, 2004).
5. Egan's (2004) list of 46 indicators of sustainable communities.
6. The Four Capitals list of 18 neighbourhood sustainability indicators (Green *et al*, 2005).
7. Carter and Fortune (2008) list of 14 project level sustainable development indicators for social housing development projects.
8. The UK government's Sustainable Development Indicators DEFRA (2010).
9. BREEAM Domestic Refurbishment (BRE, 2012)
10. Turcu's (2010:2013) list of 26 community sustainability indicators, developed as part of her doctoral work on Housing led regeneration.

Table 5.1: Seminal Policy and Academic Literature

Each of the ten key works made a significant contribution to the debate on how best to deliver sustainable projects through the provision of clear guidance on the aspects of sustainability that they deem essential. Collectively, these influential works brought together (478) theoretical sustainability themes or nodes, as documented in Appendix 5. Collectively, this body of work represents the thoughts of different academics, practitioners and official policy makers regarding how sustainability is likely to

manifest itself at the neighbourhood and project level. The various documents were entered into the QSR Nvivo data management program which harnesses the computer's capacity for recording, sorting, matching and linking data (Bazeley, 2007). A comprehensive data identification and coding process was undertaken, leading to the identification of 478 nodes, together with a number of reoccurring themes around which the sustainability nodes could be clustered, including:

o *Economy*

o *Health*

o *Society*

o *Natural Environment*

o *Built Environment*

o *Infrastructure*

o *Education*

o *Governance*

Consequently, the 478 initial nodes were mapped against these new themes. During this process, any duplicate, overlapping or similar nodes were deleted. At this point, the themes relating to *Education* and *Health* were excluded for three principle reasons. Firstly, it could be argued, health and wellbeing and Education and skills were represented within the literature by hard quantitative data, which could skew the results of the benefit appraisal, by disproportionately focusing analysis on these areas. Secondly, significant changes in health and education outcomes were likely to occur over relatively long periods, suggesting that short or medium term evaluation would be difficult and that ascribing causation would prove problematic. Finally, both fields took a strategic view, by looking at larger geographical areas than this research focused on, suggesting that linking the outcomes with individual projects or neighbourhood level activity would be impossible.

Finally, the remaining 265 theoretical nodes displayed in Appendix 5 were further refined, using two principle filters - 'local' and 'housing'-, as shown in Figure 5.1.
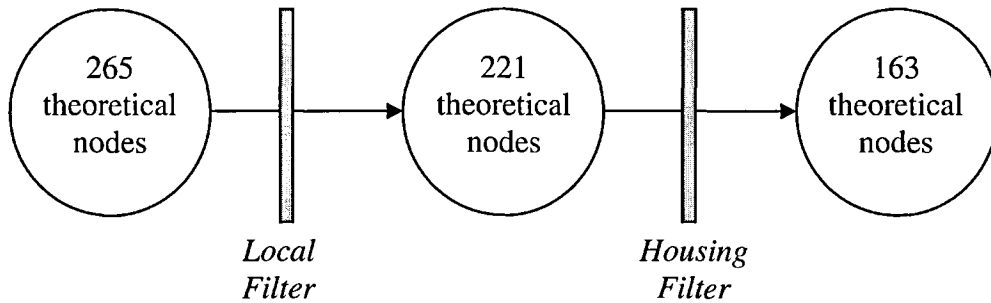
Figure 5.1: Filtering process for theoretical sustainability nodes.

The first filter applied to the nodes of sustainability was the *'local filter'*. Suggested by the *anthropocentric* definition of sustainability, the filter allowed the researcher to appraise the relevance of each theoretical node based on its suitability for the evaluation of sustainability at the neighbourhood or project level. Through the application of the filter, nodes such as 'local business activity' and 'local public transport' were identified as being important, whereas nodes such as 'air quality' and 'humanise larger buildings' were considered less 'visible' or 'relevant' and so were excluded. As a result, the number of theoretical nodes has been reduced to 221.

Subsequently, the *'Housing filter'* was applied with the principle objective of excluding those aspects of sustainability that were unlikely to be directly relevant to housing asset management. This filer resulted from the need to assess the impact of large scale housing investment projects on community sustainability. Thus, measures such as *community mix, stock condition* and *the incidence of vandalism and graffiti*, that were more likely to be affected by such investment, have been selected, whilst others such as *noise pollution; traffic flows per million vehicles* and *electoral turnout* have been excluded, as it was unlikely that investment in one tenure would impact on such macro level issues.

The analysis of the various frameworks described above resulted in the identification of six principle themes and 163 sub-nodes of sustainability, as shown in Table 5.2, which together provided a theoretical view of sustainability.

Economy	Society	Natural Environment	Built Environment	Infrastructure	Governance
void periods	Surveys of resident satisfaction	Proportion of Derelict Land	% of stock overcrowded	Proportion of marked car parking spaces	Attendance at community meetings
long term voids	Number of notices served	Extent of Fly tipping	Burnt out/ Boarded up Property	Condition of street furniture	Strategic commitment of local authority
Turnover (%)	Other Stakeholders perception of area	Household energy use	Complaints about communal areas	Access to means of transport	LA Services
Number of Homeless applicants	Number of crimes	Household water use	Density and Dispersment of stock	Public Transport	Key priorities for area improvement
Relative House Price Levels	Neighbourhood Disputes	% of homes meeting Code for Sustainable Homes	Maintenance of communal areas	Play areas/equipment	Satisfaction for LA services
Low Value Sales	Fear of Crime	% of people satisfied with recycling facilities	Households lacking basic amenities (Nr)	Cycle Storage	LA - resident communication
Relative Rental Price Levels	Vandalism, graffiti and deliberate damage	% of household waste recycled	Stock Condition	Private Car(Use and Ownership)	Local influence over decisions
Aspirational demand	Anti-social Behaviour Problems	Local environmental quality/condition	Housing Quality Indictors	Satisfaction with public transport provision	
Ave rent as % of vacant possession value	Nr of target families for ASBOs	Green Open Space	Property Type(s)	Commute (% car: % Public Transport; % cycle/walk)	
Length of residence		Renewable Technologies/energy	Nr of non-decent homes	Incidence of traffic/parking problems	
Right to buy / Voluntary Purchase Applications	Extent of community spirit	Energy White Labelled appliances	Planned maintenance expenditure/unit		
Rates of abandonment	Tenure Mix	Outside Drying Space	Responsive maintenance expenditure/unit		
% tenants resident for <2 years	Accessibility of Facilities	Energy display devices	Satisfaction with housing		
Population Density	Mix of community	Water Meter	Home user guide		
Demographic Trends	Issues with young people	Surface water run off	Day lighting		
Rent arrears	Community participation	Flooding	Sound Insulation		
Council tax rebates	Availability of Services	Greenhouse Gas Emissions	Inclusive design		
Housing Benefit claims	Childhood Poverty	CO_2 Emissions by end user	Ventilation		
Income support claims	Young adults	Energy supply	Safety		
Household Income/Income Mix	Pensioner poverty	Parks	Lighting		

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Economy	Society	Natural Environment	Built Environment	Infrastructure	Governance
Availability of Local Employment	Households living in fuel poverty	Littering and Detritus levels	Energy Efficiency (Improvements)		
% of dwellings with broadband internet access	Satisfaction with local area	Resident satisfaction with area cleanliness	Energy Efficiency (SAP Rating)		
% satisfied with local area as business destination	Change in Satisfaction with Neighbourhood	improvement in parks and open spaces	Street Scape		
Council tax banding of properties	Likeliness to stay in neighbourhood.	Renewable resources used	Housing completions (>Code 3 CFSH)		
Local business activity	Feeling of belonging (%)	Healthy (non-toxic environments)	House completions (Nr)		
Housing affordability	Feeling of safety (night/day)	Ecological Diversity	Affordable Housing/% total		
Likely household formation	Access to services; within 15 minutes' walk	Minimize damage to environment	Housing without central heating		
Population Estimates/Projection	concern about racial attacks	Building and Site orientation and Amenity	durable, reliable and functional buildings		
Rejections of accommodation	Drug dealing	Recycled materials	Aesthetic design and detailing		
Adverse reasons for leaving	Public Order Problems	Education on energy use	Flexibility and adaptability		
Transfer Requests	Facilities for teenagers	Improved boilers	Health promoting housing		
Unemployment - Workless households	Facilities for children	Low embodied energy	Integration of safety and security		
Economically inactive	Cultural facilities	Thermal performance	Demolition and demountability		
Shops	Sport and leisure facilities		Life cycle expectations		

Table 5.2: Theoretical model for Sustainable Project Evaluation

5.3 Emergent Indicators of Sustainability for the Social Housing Sector

In an attempt further to refine the comprehensive list of nodes into a set of *project centric* sustainability indicators, the researcher collected qualitative data from within the social housing organisation to develop a *praxis centric* view of sustainability. The features of sustainability identified were finally compared with the *policy centric view*, to allow the researcher to identify the sustainability indicators that were most likely to become manifest at project level.

5.3.1 Data Collection Approach

To develop a *praxis centric* view of sustainability a series of semi-structured interviews, guided by the theoretical framework, were undertaken with seven department heads, as shown in Table 5.3, all of whom had managerial responsibility for, *inter alia*, delivering aspects of the organisation's overall asset management plan. The aim of sampling a range of senior professionals from across the organisation was to develop a comprehensive view of the sustainability indicators. The interviews were all conducted at each participant's office, with each lasting approximately 30 minutes. Once again, the interviews were tape recorded with the consent of each participant and the transcripts returned for approval prior to analysis.

Interview Reference	Title of Interviewee
CS01	Development Manager
CS02	Project Finance Officer
CS03	Head of Property Maintenance
CS04	Head of Property Management
CS05	Neighbourhood Officer (1)
CS06	Finance Manager
CS07	Rent Income Manager
CS08	Early Intervention Manager
CS09	Anti-social behaviour Manager
CS10	Environmental Services Manager
CS11	Neighbourhood Officer (2)

Table 5.3: Interview Sample Frame

The interview transcripts were again entered into the QSR Nvivo data management program to facilitate extensive inductive thematic analysis using the coding framework

developed in Section 5.3. This iterative process produced features grounded in practice. The analysis of the semi-structured interviews sought to confirm the main features of sustainability and explore any additional emerging features. The results of this analysis are presented below.

Feature 1: The Built Environment

As expected, the physical and financial characteristics of the housing stock are critical to the evaluation of sustainability. Various constraints associated with the existing stock appear to frustrate the sector's ability to provide the quality and type of housing to which they aspire, with several features, including the quality of the housing stock in terms of both physical quality and design and layout, the mix of housing types provided within the neighbourhood, energy efficiency and, finally, stock expenditure appearing to dominate this feature of sustainability

Housing Quality

The physical quality of the housing stock presented a significant focus for neighbourhood sustainability. This was partially due to the organisation acquiring the stock following a stock transfer from the local authority. At that time, the stock was clearly in a very poor condition, with the physical condition having a significant effect on both existing and future residents:

> *"When the housing stock was transferred, we make a promise to our*
>
> *tenants with regards to the improvement of properties. This promise*
>
> *came on the back of our realisation of just how bad the stock was!"*
> *(CS01)*

However, this commitment appears to have been, to some extent, forced onto the organisation through various national policy initiatives, such as the decent homes standard:

> *"Ensuring out stock meets the decent homes standard is obviously a*
> *key driver behind our commitment to improvement". (CS02)*

Yet, two respondents commented on the impact that the physical property conditions had on the financial viability of the organisation, with tenants expecting 'decent' places to reside in, with many simply being unwilling to accept poor quality homes unless they had no other choice:

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"[Named estate] I suppose they were poor quality and the demand problem was because the quality was not there and the built environment was not great. Most of the properties that were there they were not fit for purpose that created the low demand". (CS04)

As well as improving housing quality through direct investment, one neighbourhood officer identified how the organisation implemented innovative sustainable solutions that both dealt with the immediate issue of housing quality, whilst also generating social benefit for the local community through tenure diversification and the inflow of investment:

"[Named] Road, about five or six years back, used to be in very poor condition. It might even be longer than that. They did a lot of work on fencing at the back. I do know, don't quote me on this, I forget the exact amount because I wasn't in this area at the time. They sold a number of properties. I think it was for something ridiculous like £1, as long as they promised to invest so much money into doing them up". (CS05)

Finally, the development manager opined that the funding criteria for new development often mean that national standards, acting as proxies for quality, are imposed on aspects of the organisation, with quality almost becoming another aspect of sustainability, influenced by a tick box mentality:

"We've got to tick the boxes for HQI (Housing Quality Indicators), Eco Homes level, Eco Homes Very Good, but now they've changed back to Code 3, Lifetime Homes, design and quality standards". (CS06)

Housing Design, Size and Layout

In addition to the physical quality of the accommodation a number of the interviewees identified that the size and layout of the housing offered provided a second major consideration for the local community:

"It is a nice estate in lots of respects. It is in a good location. Nevertheless, there is a high percentage of one bedroom flats on the estate, which are very small and they are not very popular. As a

*result, they keep turning round. People get fed up of living there, I
suppose, for want of a better experience". (CS03)*

*"That's what we need actually, two bedroomed bungalows that are
laid out to suit disabled tenants". (CS05)*

*"We have got certainly two schemes where there are communal
bathrooms so that's a problem because in 2010 people can't be living
like that". (CS04)*

*"Tenants want decent sized housing. I don't get a lot of these [showing
the interviewer a large semi] coming empty". (CS11)*

*"A lot of people are in two-bedroom flats because they want them or
three-bedroom housing because they want them". (CS06)*

The problems associated with the size and layout of the housing stock were further
compounded in areas where changes in population, due to wider economic factors such
as changes in employment availability and immigration, had resulted in a housing stock
that was no longer meeting the needs of the local community:

*"[Estate] was surrounded by a big Black and Ethnic Minority (BME)
area community. We've just done a survey of new customers and the
people round there said that they would never move on there in a
month of Sundays mainly because of the reputation but because there
were no three and four bed houses and they were wanting bigger
family housing". (CS04)*

However, the two neighbourhood officers interviewed, who had responsibility for
letting properties, opined that the external appearance or design of individual properties
generally does not influence people's housing choices in the same way as it would with
other housing tenures, such as owner-occupation:

"The actual house appearance isn't really causing the problems".

(CS05)

*"I don't like them, but they don't come up that often. They look like
prison cells to me. Off road parking and they tend not to come up.
Then these are the ones. Flat roofs, prefab, whatever". (CS11)*

This view was reaffirmed by the head of property management, who confirmed that the size of the property was the primary design driver for new developments, especially where the organisation sought to respond to the needs of the local market:

> "We have been fairly strict on having a strategy of building predominantly three and four bed houses and bungalows, some two beds, but we did not see the point in building two beds when there are 3000 empty terraced homes in". (CS04)

Housing Mix

As well as the clear views offered about the specific size and layout of individual properties, one neighbourhood officer identified the need for the organisation to meet the demands of their tenants in terms of providing a variety of housing within the community to allow tenants to move as their needs change without having to leave the community:

> "Yes. Obviously, you're in a three bedroomed house that you want to downsize or sell, you know, you want something suitable. If they like the estate and they don't want to move off the estate". (CS05)

As the organisation's financial manager asserts, this need for a mix of housing has been exacerbated by the introduction of the spare room levy as part of the government's changes to social housing provision whereby tenants will have to face difficult choices:

> "A lot of these people do it through choice because they want that property or they've been, like you said, they had the house and brought the kids up and they want to stay there. A lot of people are in two-bedroom flats because they want them or three-bedroom housing because they want them. But they're going to have to make a conscious choice to actually move out or stay where they are and pay the difference". (CS06)

Yet, as both the head of property maintenance and the rent income manager assert, in some communities, the range of available housing is less diversified than it could be, which may cause difficulties for some tenants:

"Naturally, some estates have got a high level of three bedroom houses. Some have got a lot of flats and that definitely has an impact". (CS03)

"That's when you do need the flats because those people...We've got that diversification of properties, we've got those facilities for our organisation's houses, but those people have to be happy to move into...If you've lived in a three-bedroom house and all of a sudden someone says you've got to live in a one-bedroom flat, it's a big change. But ultimately you have to pay for it". (CS07)

However, there does appear to be a realisation within the organisation that they need to ensure that the range of housing provided in each community is as diverse as possible to meet the needs of tenants:

"So basically I looked at all the land that we still owned, did some feasibility studies on whether it was deliverable from a construction point of view. But also in conjunction with the asset management team identified the sites where we had areas where we needed more housing, because we have a waiting list and we know that". (CS01)

Yet, in selecting the housing types to be developed, the locality must also be suitable for that particular type of housing:

"I've got this piece of land, thinking of building some properties on it. We don't know what yet, but are there any issues that we need to consider?" Because if we were thinking of putting elderly accommodation on it and there were anti-social behaviour (ASB) issues, if there were a lot of families in the area, with lots of children, that would have an impact on whether we would decide to put bungalows on there". (CS01)

However, the early intervention manager suggested that, sometimes, such issues are overlooked, as such decisions are also heavily reliant on the availability of funding. Taken together with the need to comply with other regulatory standards, this can lead to inappropriate development.

"Social landlords have certain standards to meet, and certain funding. If I can get the funding for retired living, I'll up the number stock I have of retired living, but where can I put them? And it never seems to correlate; well it's the older people, they're generally less tolerant of the younger people, they tend to need more facilities and amenities. Let's stick them right in the middle of a council housing estate". (CS08)

Housing Maintenance

Social housing providers generally have a long term interest in the housing stock. As such, on-going expenditure relating to planned maintenance is seen as a critical aspect when evaluating the overall sustainability of the neighbourhood:

"The stock condition is used to decide on future major investment programmes, planned maintenance. So the planned programmes will be put together based on life cycle components, feedback from people, technicians . . .but will also be dependent on the viability of individual properties or estates...based obviously on forecast expenditure profiles". (CS03)

However, in addition to the quinquenial appraisal of planned maintenance, the costs associated with tenancy churn are seen as critical when appraising the sustainability of an estate:

"Turnover is a big problem for us, because it costs us a lot of money. So those are the things that you can, perhaps, get a bit closer to measuring. It is the impact that turnover has, for instance, in that particular example". (CS03)

"We take into account such things as void loss, which is being empty, average days void, cost per re-let, and we use the void loss figures for that particular estate to assess its sustainability". (CS02)

The full economic significance of tenancy churn is captured from the interview with the head of property management, who opined that one void property can cost upwards of £3,000 to protect and repair, before the loss of income is factored in:

"It's the void loss sort of thing for properties remaining empty, on average, you could say, five weeks void loss per property. Each void on average would cost us around £3000". (CS04)

Energy Efficiency

The social housing provider acknowledged the increasing importance of reducing fuel poverty amongst their customers, as such energy efficiency, thermal performance and importantly the correlation with potential for tenants to suffer from fuel poverty featured strongly throughout the interviews:

"For our existing properties, we like to monitor SAP ratings as these give a clear indicator of energy efficiency and link to the whole fuel poverty concept". (CS04)

"They are going to do some sort of...Well, how it's sold to me and how I tell people...A bubble-wrap around it and then rendered". (CS05)

"We built some retired living accommodation, bungalows. Really nice, eco-friendly, all inclusive with heat retention". (CS08)

In addition to the improvements made to the physical structure to reduce heat loses, the retrofitting of renewable micro generation equipment to properties appeared to be one of the principle ways through which the organisation was seeking to achieve this objective:

"We are putting solar panels on a large amount of our stock". (CS01)

"Last year, we were the first in this area to do solar panels on more than 10 properties. There are 31 properties with solar panels. So we've actually reduced the costs of people's energy bills by a third, times 31, which is generating x amount of pounds". (CS01)

However, it also became clear that some of the work was undertaken to tick boxes and secure funding, rather than achieve real benefit for customers:

"So we've got £1.2m and we've got to tick the boxes for Ecohomes level, Eco Homes Very Good". (CS01)

Although this might have been a reaction to market pressures as opposed to a clear change in the overall objective of the organisation, with the Development Manger

asserting the difficulties faced when attempting to sell properties built without public subsidy for the owner occupation market where micro generation technologies have been installed:

> ". . . .because you have got a solar panel that great, it's going to pay you back in ten years' time. They would much rather you knock £10,000 off the value of the house and not put solar panels on". (CS04)

As a result, properties developed privately for the owner-occupation market are developed to current building regulation standards and no higher:

> "So we're just looking at the moment for the first time of building without grants, probably building at a code three instead of a code four, so they'll still be very good. They'll be better than your typical new build boxes but they won't be at that premium that we have to build at for level four". (CS04)

Feature 2: The Local Environment

In addition to the housing stock, the environment within which the stock is developed was also identified as an important area of focus within the theoretical framework, with a clear desire to ensure that the relationship between the physical environment and the natural environment is maintained. Once again, the interviews have identified a number of issues, problems and constraints associated with the local environment, and incidentally how the organisation's customers interact with the local environment.

Quality of the Local Environment

The quality of the local environment within the neighbourhood was the first major issue to emerge from the interviews. Unsurprisingly, the interviews identified the difficulties associated with mixed land ownership. The early intervention manger opined that, in some areas, the local authority has adversely affected the quality of the local environment:

> *"Then you've got the issues of the council in a particular area. They won't put lights up, and due to the cost cutting for gardens, only cut five feet or something of hedges. So because this area is a sort of wasteland, they refuse to cut it. So the information the police have got, they're now hiding the drugs in there, doing the drug deals because it's low lighting. That's the other consequence. You've got the drug dealers and all the other social misfits that are going there". (CS08)*

These problems are further exhibited in areas of stock where the roads are lined with grass verges, which are again under the control of the local authority:

> *"Plus you've got grassed area which is the grass verges, but there's no parking. This leads to other problems . . ." (CS08)*

> *"You've got issues with the grass verges, and trying to get the council to take any action against anybody is like pulling teeth". (CS09)*

> *"There are problems with parking. You see them on the grass verges. We wanted to try and get some of them taken out". (CS11)*

Yet, where areas of open space have been provided within the estate to improve the overall quality of the experience for the residents of the properties, which is under the

control of the social housing provider, it is clear that the local residents have an important role to play in their preservation:

> "That's a big waste of space [a large open area of lawn] really, but I don't think you can build on it. There is a tenants' group in this area, and they are putting in for funding to create a huge patio area in the middle. They are lucky that kids don't actually play football on it. If they do, they scoot them off". (CS05)

Even so, the benefits of the residents' policing and, to some extent, taking ownership of the open space does seem to be having a positive effect:

> "There are two largish areas of grass that are ideal for fly-tipping, but we haven't had to pick any fly-tipping up off of those areas for about three years". (CS11)

To conclude this section, one neighbourhood officer captured the benefits of a quality local environment, even if the built environment is somewhat lacking in terms of design and kerb appeal:

> "That little area's nice. It has a real quality about it, but the houses, I think, look goddamn awful. Not a very high turnover. People have actual bought them because they love it so much". (CS05)

Appearance of the Local Environment

Continuing from the discussion of the quality of the local environment, it became clear that the appearance of the local environment is fundamental to the commercial success or otherwise of a neighbourhood:

> "It's very much appearance and aesthetics and graffiti, and problems that seem to differentiate the estate's really". (CS05)

> "Whereas, obviously, the nicer the area looks, the more likely people are going to want to come and live here, the more likely they're going to want to stay, the more pride they're going to have in their own area". (CS11)

> "You do see a massive difference in how many people bid for the properties. It tends to be that the harder to let. . . .So aesthetics,

appearance, and perceptions, whereas other parts of the estate, first offer and it's gone. Whereas on these I can get to the 13th offer, 15th offer, and there may have only been 30 people bid for it". (CS11)

Yet, given these comments, it would appear that the linkage with the quality of the local environment may well have been influenced by the provision of open space, although one neighbourhood officer did suggest that open areas do not appear to influence property decisions:

"These big areas of landscaping don't really do anything for the let-ability of the property". (CS05)

It was, however, suggested that the perception of the neighbourhood is strongly influenced by littering, graffiti and vandalism:

"Its silly signs, some people said it is the littering, dumped rubbish, dog fouling, stray dogs, etc. Unkempt gardens is the next one, where you've got the grass verges they're all churned up and it's all visible signs of, 'I don't care'". (CS08)

This point was echoed by other interviewees, who also identified that the general appearance of the estate is the major barrier to improvement:

"It's the general appearance. On the better estates, you might see privet hedges are established. Where you get on [the worst estates] and it tends to be fences that are broken, missing. I think these make a difference, they make it look nicer". (CS05)

"In the surrounding areas, there is a lot of litter, a lot of fly-tipping and, like I say, the total amount of graffiti. It's a little bit more 'gangy' down there". (CS11)

As would be expected, this then leads to the argument purported by broken window theory, whereby the problem escalates uncontrollably, further negatively affecting the appearance of the neighbourhood:

"There were a couple of years back where the litter, I have to say, is about yea deep, two or three inches for a third of it. The houses on the [named road] side, all the garden fences have been smashed on the

side of the path. It's knee deep in rubbish. Quite a lot of it is obvious fly tipping, but it's that same type of scenario where it looks a mess, full of rubbish, so the tenants think, 'Let's dump mine too'". (CS08)

Simply investing in aesthetic improvements to the estate, however, is unlikely to make any substantial and sustained improvements:

"There's been quite a bit of money spent on fencing, car parking, the aesthetic appearance. There are still problems on here. There are problems with parking. You see them on the grass verges. We wanted to try and get some of them taken out. You've got dogs, dog crap all over the place". (CS11)

Rather it has been opined that changes to the management of the neighbourhood, implemented through the proxy of increasingly rigorous tenant selection processes, are an important dimension alongside physical improvements:

"The estate could be gorgeous if you got rid of the bad tenants and looked at putting some secure by design or parking in the area". (CS09)

"Like I said, we are starting to get better. Like this street, it used to be quite bad. We'd got quite a large number of empty properties all at once, and we basically were fortunate enough to replace those with decent tenants. They've started taking care and pride in where they live. Then the ones that weren't have started looking after theirs. Sort of like a snowball effect. Probably our worst street is the one we're looking at to the right". (CS11)

"What we have got as well, like this one here is a Polish chap. We have a number of Polish families who've come in onto [named road] and they all seem to come in and take pride in where they live, and put money and effort into the gardens and houses. That has been one of the major factors in the improvement of [named road]". (CS11)

The resulting effect of such changes to the management of the estate will subsequently be residents who start their tenancies with a sense of pride:

"If we help them to start off with at the start of the tenancy that helps. If you go through an estate, "Oh I like this. I want to come here. I'm a good tenant and I like it so I want to keep it good". (CS05)

"If you put tenants in, it's got a good garden and a good property, nine times – I know there's always an exception – but nine times out of ten, "Oh, I've got something nice. I'll look after it". If you've got two together, the impetus is there. It's a stronger pull to look after it". (CS04)

Even possibly leading to a situation whereby residents who are renting from the social housing provider will take more pride in their home than those who have purchased them through the right to buy scheme, thus having a stake in preserving the appearance of the community:

"As you're driving down here, mainly you can see which ones are the owner occupiers, because they're letting everyone else down". (CS05)

Design of the Local Environment

Frustration with the design of some neighbourhoods has been expressed, although this was mainly from a crime and anti-social behaviour problem perspective. Nonetheless, it is clear that the design and layout of some communities does present a number of problems and can adversely affect residents.

The first significant issue identified was the inclusion of poorly lit narrow alleyways running between properties which, in addition to increasing the fear of crime, also appear to act as a magnet for other issues raised concerning the appearance of the estate:

"Some of the estates, you've got ginnels. A lot of dealing goes in and around the ginnels. People are quite intimidated and frightened and won't use the ginnels. Around the side of the ginnels, you've got gardens and the fences get broken and the gardens get fly tipping". (CS09)

"The complaints that we've got at the moment tend to be that people are congregating in alleyways". (CS11)

Further design issues have also been raised, from a policing viewpoint. The lack of vehicular access, often associated with the development of the so-called 'communities in the sky' of the 1960s and 1970s, presented a significant barrier to effective policing, leading to increasing problems with crime and associated activities.

> *"The problems with that was I think they were built in the 70s if my memory is right. I'm old enough to remember. They were that type of generation where they were coming away from high-rise flats and trying to get more family focused communities. So they had flats, maisonettes that were designed...But they were all designed with that effort of, we don't want to have access for vehicles. It's all foot access. The issue from a policing perspective was, once they got hold, they had quite a few younger families and undesirables who moved in. So they were coming in and causing damage to the property. We had a lot of warrants we were executing for drugs and so on. But when you went in, it was like a maze. Which footpath do I take? Do I go on this footpath and get to one of the blocks, but it's not the obvious block you think you're going to. Literally across the road at an angle, if you're in [named] flats, to [named road] with one running through the middle. So it's like three terraces but one ended in a dead end".*
> *(CS08)*

Garden Facilities for Local Residents

Intertwined with the appearance, quality and design of the local environment was the provision of private outdoor space. It has been strongly suggested that private outdoor space is an important part of the sustainability of a community and the environmental appraisal of the built environment through the provision of, *inter alia*, drying space. Yet for the social housing sector, the interviewees' identify the provision of private gardens as both a blessing and a nightmare, with a clear bias towards the latter, although the majority of residents take pride in the external space, and maintain it well:

> *"Many of the gardens are fairly well kept, so we don't really have any problems". (CS10)*

> *"If you put tenants in, it's got a good garden and a good property, nine times – I know there's always an exception – but nine times out of*

ten, *"Oh, I've got something nice. I'll look after it". If you've got two together, the impetus is there. It's a stronger pull to look after it".* (CS09)

Some residents do not appear to see the benefit of the private outdoor space, with some viewing it as just another job to do:

> *"They don't look after them! If you were to actually buy a property, and you wanted that size of garden, you'd pay an extra £20,000 for the garden. Yet they don't seem to appreciate what they get a property with it. And fencing. Fencing! Whichever area you're in, fencing, they don't...I mean, I worked for the council many years ago and fencing has always been a very low priority. I think that's changing now. I think they're putting some money into it, aren't they"?* (CS08)

However, in these situations, it could be an external sign of a customer with potential problems rather than a simple lack of appreciation:

> *"I think that, all said, a particularly dirty garden, overgrown and unkempt, is an indicator of further problems inside the house. You tend to find a lot of social issues inside the house once you get a foot in the door if there's a dirty garden as well. That does tend to correlate, doesn't it"?* (CS09)

Even so, the appearance of 'unkempt' gardens can have deeper sociological links, with the environmental services manager suggesting that the customer may simply decide to ignore the garden, as result of the overall appearance of the community, and a sense of a general lack of pride or even interest in the appearance of their community:

> *"There is a lot of graffiti around [one estate]. We have noticed the people don't have the same attitude. This particular member of staff mentioned it being a rougher sort of people, a rougher attitude, not taking much pride in the garden".* (CS10)

This situation can also work in reverse. As the anti-social behaviour manager suggested, it may be that a sense of community pride and commitment could motivate even an uninterested person to make an effort:

"If you've got two, a bad one, and then two more, they can work on
socialising to get the bad one sorted". (CS09)

Finally, it was suggested that the design and layout of the estate could also be an influencing factor, with issues associated with communal garden facilities, specifically with apartments where a service charge is not applied to cover grounds maintenance:

"It's getting people to take ownership of the gardens and stuff like that
in flats". (CS05)

Together with the overall size of the gardens provided, as the environmental manager opined, the scale of the maintenance commitment facing some tenants may be the problem:

"When you do go to a void garden there, they are big gardens at the
back and they've generally not been touched much. You're going into
a jungle; it's covered in brambles". (CS10)

Parking Facilities for Local Residents

The provision of off road car parking within the boundary of the dwelling appears to be increasing in significance, with increasing levels of car ownership amongst social housing tenants:

"I think part of the problem is to do with the parking, the grass verges.
There are very few properties with driveways". (CS09)

"Sometimes, I'm digressing, but it's just to come back to the example
of one place I worked had a pavement that was as wide as some of
these grass verges. Cars used to park on them. But they did it in a way
that blocked access for pedestrians". (CS08)

Even so, not everyone agrees. One neighbourhood officer, working in a higher quality area, with high levels of client satisfaction, suggested that the provision of off road parking is a nice 'extra' but by no means essential:

"Off road parking makes any difference? No, not really. It's very nice
if you've got it". (CS05)

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Features 3 & 4: Economy

Features relating to 'economy' strongly dominated the interviews, with respondents espousing a significant diversity of issues. To ensure that these issues are correctly analysed, they have been separated into two further features of sustainability. Feature 3 considered internal economic issues, such as market demand and demographics which, whilst important from a commercial viewpoint, will not be directly relevant to customers, whereas feature 4 deals with local economic issues, such as employment, that is clearly of more relevance to the social housing providers' customer base.

Feature 3: Market Dynamics

The professionals working for a social housing provider were, as could be expected, keenly aware of the impact of market and demographic data on the eventual viability or otherwise of potential projects. Invariably, such issues would subsequently affect the tenants and others living in the neighbourhood under scrutiny.

Demand

Unsurprisingly, the first major issue identified as being critical to the decision process was the demand within the neighbourhood. If the neighbourhood is in high demand, it appeared that it was invariably more likely to receive significant investment, concentrated on increasing the supply within that community:

> *""Knowledge of the area, and whether we feel they would sell or whether they would be in high demand. We also look at the 'waiting list statistics when we are determining whether it is high demand, because they'll say "Oh we get 60 bids per property when any property on this estate comes up for let". So that would be one of my indicators that, when I got to the HCA for funding, I say, "It's a really high demand area. We get 60 bids per property, so we know it's a good, profitable scheme". "So that'll be one tick". (CS01)*

Others within the organisation, however, challenged this view, opining that, in the current marketplace, given the changes in the way in which benefits are issued together with the problems that households are facing related to the increasing cost of living, all neighbourhoods, good or bad, are over-subscribed:

"The waiting list for any type of property is over-subscribed anyway".
(CS07)

"If you're just on the basic waiting list, you could be waiting five/six/seven years". (CS06)

"There's thousands on the waiting list, yes. So as soon as one comes empty it's going to, basically... " (CS07)

However, one respondent did opine that this is a recent phenomenon as, prior to the stock transfer, some estates clearly exhibited low demand and unpopularity issues:

"When it was council, you always had a lot of empty properties and areas that you couldn't let out. So those that were desperate probably would go to [Estate A]". (CS05)

Clearly, despite the length of the waiting list, the potential unpopularity of certain pockets of housing stock remains a key consideration. As such, other demand indicators, such as tenancy churn, durations and void durations, are keenly monitored:

"Void rates between houses and flats do vary. Especially in some areas, flats are more difficult to let, and they do get empty more and that sort of thing." (CS02)

"Turnover is a big problem for us, because it costs us a lot of money, so you can, perhaps, get those things a bit closer to measuring. It is the impact that turnover has, for instance, in that particular example".
(CS03)

"The popularity of the estate is not a problem. We have an average turnover of 28. Our target is 28 days. I think we're just under that, on 26. It's just there is a high turnover". (CS10)

Although the organisation actively monitors the demand statistics, the interviews revealed a number of contributory issues, which would need to be considered if stock investment were to be proposed in response to demand indicators, whilst issues such as problem tenants would clearly fall within the area of housing management with a view to the tenant selection procedures:

"To be honest, at the minute, it's vastly improved, in my opinion, the
standard of tenants that we seem to be getting. A lot of the times when
there is a turnover, sometimes, we're not too sorry to see them go. It
tends to be people that come in and they don't pay their rent and move
on". (CS10)

It is also important, from a strategic asset management viewpoint, to ensure that the stock is fit for purpose, if situations such as that recanted by one employee are to be avoided:

"They all became very, very poor quality, low economic value. So a lot
of people are getting them for rent, for this property portfolio. Then
all the problem tenants that used to be in [housing association] and
the Council were displaced to there. They just literally let the place
run down. The properties were disgusting". (CS08)

Yet, it is also clear that, in some neighbourhoods, the stock is exhibiting problems, which result in a spike in social exclusion and other associated problems, with a number of interviewees identifying the many difficulties they face with apartment style dwellings:

"It is a nice estate in lots of respects. It is in a good location. But there
is a high percentage of one bedroom flats on the estate, which are
very small and not very popular". (CS03)

"There are loads of one bedroom flats on the estate which people
don't want because they are too small. As a result, they keep turning
round. People get fed up of living there, I suppose, for want of a better
experience". (CS11)

Even so, it is clear that such high levels of churn are causing wider problems within some neighbourhoods. As one neighbourhood officer, with day-to-day responsibility for the management of such estates commented, high levels of churn eventually destabilise the wider community, leading to increasing turnover and harder to let housing:

"There might be houses where people are actually quite settled,
become unsettled because there are these different tenants coming and

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going, you know, a bit too often. People like stability, and it does have a knock-on because it might be that somebody who is living across the road or next door to flats that are turning over says, 'Oh, I don't like this anymore. We'll move'". (CS11)

There was evidence, however, that demand and other social issues are starting to inform the organisation's strategic development plans. As the head of housing development highlights, as part of the strategic brief for new affordable housing schemes, user need assessments are being undertaken:

"If we were building affordable, we'd look at the localising needs assessment, and essentially what that is saying is that there is a requirement for three bedroom houses and two bedroom bungalows". (CS03)

"The planners would come back and say, 'You cannot just build three bedrooms in that. We might want some fours'. There's a big overcrowding problem in this community so larger family housing is definitely required. But that is where we start from in terms of what we were going to build". (CS03)

Reputational Impact

Interconnected with demand is the impact of the neighbourhood's reputation:

"[Estate D] was surrounded by a big BME area community. We have just completed a survey of new customers and the people round there said that they would never move on there in a month of Sundays, mainly because of the reputation". (CS04)

"As well as that, even though there have been improvements, there's still obviously the name. What do you say? Mud sticks. [Estate A] still has a bad name for itself now". (CS10)

Even the legacy of a previous negative reputation can clearly have an impact on both potential residents and even the organisation's own staff. Indeed, one neighbourhood officer candidly outlined a fear of being re-allocated to a particular neighbourhood:

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"I thought, 'Oh, God, no'. When I was younger, it always had a bad name for being a bit rough. Anyway, I came with one of the lads I work with and we had a drive round and I said, 'It doesn't look that bad. Go on then. I've give it a whirl'". (CS05)

Before explaining their fear of visiting other estates within the portfolio which was stereotyped by a poor reputation:

"If I go on [Estate A] for anything, sometimes I feel a bit, you know, but you come on here and I think it's quite relaxed". (CS05)

Having outlined the clear effects that the reputation of a specific neighbourhood may have, the neighbourhood officers interviewed seemed unable to agree on the actual impact that the reputation had on the leasability of properties. One opined that prospective tenants do not mind; they just look at the property:

"Tenants decide on the property, or do they just decide on the estate? When they want to move on do they get, 'There's this particular property and you can...?' I think they just look at the bedrooms and think, 'I need a three bed', and put their name down". (CS11)

Whereas the other neighbourhood officer suggested that reputation is a major driver, with the perception of the estate clearly correlating to demand:

"Those that were desperate probably would go to [Estate A]". (CS05)

The reputation of particular estates was also having a wider effect on the community, as on one particularly difficult estate, it had become impossible to let commercial retail units:

"The perception of it causing problems puts them off. So I think that's one of the reasons why we're struggling to let it. We've had a few enquiries, but we tend to never really get anywhere". (CS11)

Feature 4: Local Economy

In addition to aspects of the economy, which are unsurprisingly deemed significant by the social housing provider, relating to its commercial interests such as demand for housing, the interviewees also spoke at length about the importance of the local economy when evaluating the sustainability of the neighbourhood and when considering the benefits associated with potential interventions.

Shops and Commercial Facilities

Access to shops and other commercial facilities forms an integral part of many of the interviews, with a number of respondents highlighting the importance of such facilities to the local community. Retailing is seen by most as a key aspect of a sustainable community:

> *"You have your chippy, your hairdresser, your convenience store. I think he's a bit dodgy in that one actually, in the convenience store". (CS05)*

> *"So you've got the new Asda, the Lidl, Aldi, Iceland. You've got the leisure centre literally two minutes down the road". (CS08)*

In addition, it was also clear that those living in the neighbourhood attach significant importance to the fact that they can access local shops:

> *"The residents, most of whom are our tenants, want shops in their community". (CS08)*

Yet, the interviews revealed that just having shops is not enough, It is essential that the social housing provider supports the local shopkeepers to ensure that issues associated with crime and anti-social behaviour are managed effectively:

> *"The Chinese chippy, they've had a lot of problems. They've been targeted with anti-social behaviour, racially. Even people on the estate don't come down here in the evening, because he only opens in the evening. Now, in an evening, both [sandwich shop] and the newsagents are shut, so there's only him open. You tend to get a gang of kids hanging about outside. In his own words, he's said, 'They*

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don't cause a problem, they're just stood there'. They don't cause him any problems; they just cause anybody passing by a problem". (CS01)

"Quite a nice area, but they're struggling to attract customers. So shops are losing custom, ergo the shops don't want to be there. But society wants them in the community, so I think if we put CCTV in and highlight that we're looking after that area, we should get more shops, more custom, benefit the community. And hopefully, I think most people see, wherever there's a shop and a light, hopefully a reduced number of kids. Or at least if the kids are there, they won't be causing antisocial because they'll know they're being monitored". (CS08)

The development manager further opined that simply attracting a retailer to a neighbourhood was likely to trigger both social and physical improvements:

"The other thing that we are actually looking at is the commercial element, which is bringing in private investments through, whether it's a small supermarket in the middle of an estate, which we would then say, 'Well, if you're going to that, we want you to work with the council in providing a nicer gateway to get to your supermarket which enhances the area as well'. We would work with the council to make sure that that happened on our estates". (CS01)

Employment and Benefit Dependency

During the interviews, acknowledgement was made of the fact that social housing tenants could not afford high rents. However, they were able to get assistance from housing benefit (soon to become universal credit) to supplement or pay their rent in full, depending on their circumstances:

"You've got to understand 80% to 85% of our customers, our tenants, are on some sort of housing benefit, either full or partial. So it's a big, big chunk of our income and we rely heavily upon that". (CS06)

Yet, uncertainly as to the future of social benefits, under the government's policy review was clearly impacting on the social housing organisation at the time of the interviews, in late 2011.

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"I think, over the last four years, it's taking a lot longer to get the claims processed anyway. But at the moment we're getting a significantly higher proportion of our customers' claims being suspended, one after the other. There's a higher volume of people going into arrears due to the fact that benefits have been suspended". (CS06)

"One of the major issues is housing benefit claims...Quite a few are getting suspended at the moment, I've found. It's all well and good if they get put back into payment but there are issues regarding changes in circumstances and then there can be debt". (CS07)

As a result, it became increasingly clear that the social housing provider identified itself with having a significant social obligation to enhance the employment opportunities in the local community:

"We do a hell of a lot of stuff on worklessness so we have taken more neat trainees than anybody else in the borough; we have taken more from the future job fund places than anyone else in east Lancashire so there is other means and ways of trying to help the local community. It's integral to us that, for the majority of our customers, if we can get them into jobs". (CS04)

Specific examples of ways in which the organisation attempts to achieve this objective included investing in craft training facilities, and encouraging contractors to provide work placements and encourage the recruitment of apprentices:

"On our new affordable homes developments we've been looking at is training and employment, that is one of the high priorities for HCA now, and economically for the borough it's also important. Our contractors have to employ one trainee per million; they have to engage with the community". (CS01)

"Our Director of Regeneration does a lot with a training organisation, and we're just looking at purchasing a site on one of our estates". (CS03)

Indeed, the development manager suggested that the impact of this and similar policies resulted in an estimated £850,000 of community benefit being spent on just one £4m affordable housing development:

> "We are saying what we are going to do is that we're going to put in £850,000 of value back into the community. How we're going to do that is if you employ somebody, so you look each year to host a programme taking on 15 candidates each term. So they will do things like remediation on the ground, bricklaying, plastering, roofing, whatever". (CS01)

Yet the positive effects of this one project on the community could be the creation of eight permanent posts.

> "So with the 60% success rate meaning a possible eight people will go onto find employment. So those people that weren't in employment, were claiming social, whatever they call it". (CS01)

Housing Tenure

The provision of a mix of housing types and tenures has been part of housing policy for a number of years. It has been strongly associated with the social sustainability of a community. The mix of housing tenures across the social housing providers estates was made clear by the majority of the interviewees:

> "As you can see, traditional, garden front, garden backed. Most of them are well looked after. A lot of owner occupiers on here. You can see which ones are the owner occupiers, because they're letting everyone else down". (CS05)

Yet, the mix of tenures on some estates resulted from the operation of the 'right to buy' policy, which policy was also identified as the primary cause of a number of social problems in certain neighbourhoods:

> "Normally, the private rented tenants are the ones that cause the trouble. I think it's more of a rarity". (CS05)

> "The problems we tend to have on here are with where you've got two directly across that are private. It's quietened down at the moment. I

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think there are four in this little... They're private. They are privately owned and then rented out, which can create the problem in we evict somebody and they move into another property offered by a private landlord The landlord didn't give us information about who he put in. Those tenants then caused antisocial behaviour problems for a while until he evicted them or they moved on". (CS10)

Feature 5: Community

The notion of community or society was certainly an important issue to all those working for the social housing provider. Potentially, this resulted from the clear social ethos within the organisation, with a clear focus on social benefit as opposed to return on investment for shareholders, effectively putting society at the centre of the social housing movement. As such, any potential investment scheme needs to consider the anticipated social benefits generated.

Crime

In some neighbourhoods, crime is becoming an increasing problem which the social housing organisation is attempting to overcome although some within the organisation have suggested that, when considering potential improvements, it is important that crime reduction is fully integrated into the proposals:

> *"On some of our estates, crime problems are catching up with us, especially in respect of drugs problems. There's a lot of growing within the [stock], with people actually growing cannabis". (CS08)*

> *"The semis are the more prone, that's the bulk of our stock. I would say semis are dealing and growing, purely because, if you do flats, you haven't got the roof space, so they're targeting smaller families, aren't they; individuals?" (CS09)*

Whilst drug cultivation and use is one of the major crime problems, the more socially excluded estates are also evidencing escalating issues associated with burglary, domestic violence and the theft of electricity:

> *"Worst – Socially excluded estates - Quite a bit of theft crime, domestic violence". (CS08)*

> *"I used to manage the flats at [centre of town] and we saw endless problems. A lot of young, single men. We used to go in there and inspect them and every other one would bypass [the electric meter]".*
> *(CS06)*

Yet, it is not social exclusion *per se* that has led to the noticeable increase in crime. This was particular commented on by the anti-social behaviour manager, who observed that, often, organised criminals take advantage of vulnerable individuals:

> *"So they're targeting smaller families, aren't they, individuals? They are. They do tend to target vulnerable individuals as well. Generally males, I think, for the growing". (CS09)*

Anti-social Behaviour

In addition to the levels of crime, anti-social behaviour considerations are also seen as a key dimension of social sustainability within neighbourhoods, with a number of the interviewees commenting on the need to ensure any physical improvements to the fabric of the estate also attempts to mitigate the effects of anti-social behaviour:

> *"Bonfire Night, the fencing disappears. But the practical measures that fencing can stop. Say somebody is getting targeted; their garden is getting run through. And I think we need to put resources into the fencing side of things". (CS09)*

However, when exploring the nature of anti-social behaviour on the estates, it became clear that other social issues are making a major contribution which physical improvements to the stock are not likely to overcome. However, some issues could possibly be mitigated if the social housing provider looked to invest in facilities for the teenagers and young people on the estate:

> *"Generally, I think mostly in [estate A], not necessarily [Estate B], there's not much for the young people to do. It's a very compact area, [estate A], and they're very territorial as well. They won't move outside the area, and there are no activities for the kids to do in that area". (CS09)*

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The effects of this lack of provision for teenagers, it was suggested, develops into a larger problem, as increasing numbers of people congregate at various points around the estates:

> "And then, once you get one, you tend to get a few others, don't you? They always have friends. It's their friends and associates. They start to go down that route to a greater or lesser extent and then it sort of cascades down, which is an issue". (CS09)

In turn, these problems then impact on local businesses and, inevitably, local residents:

> "The Chinese chippy, they've had a lot of problems. They've been targeted, antisocial behaviour; racially . . . now they're not getting as much harassment, it's the perception of the area. Even people on the estate don't come down here in the evening, because he only opens in the evening. Now in an evening . . . You tend to get a gang of kids hanging out outside. . . . He's said, 'They don't cause a problem, and they're just stood there. They don't cause him any problems; they just cause anybody passing by a problem". (CS01)

The final issue raised during the interviews was the suggestion that simply making the case that a neighbourhood needed additional facilities such as play areas, then implementing these schemes as part of any built environment led project could prove counterproductive. as such facilities can attract increasing levels of anti-social behaviour:

> "We have a playground and we always have trouble with vandalism on there. We get fly-tipping on the grass and vandalism to the play areas. It's usually the safety surfacing that's the target, or swing seats and dogs. They like to swing the seats and their dogs grab them and chew them to bits, which is a lot of fun for the dog and presumably a lot of fun for the person doing it, but obviously it's hard to replace and children can't use them after they've been chewed". (CS10)

Yet, the interviewees also surprisingly asserted that spending money on improving rundown community facilities such as playgrounds could also intensify neighbourhood problems, as these facilities do concentrate and to an extent control anti-social behaviour (ASB) problems:

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"There's an area there that's now overgrown. It was a play park, wasn't it? They wanted us to look at what solutions we could come up with, and I think everybody actually agreed, leave it as it is because when they're in there, they're not actually affecting anybody else but themselves". (CS09)

"You will see the difference just from one end of the street to the other. This is [named road] and this is, I'd say, my hardest to let. Basically its antisocial behaviour and nuisance. There was a big drugs problem on here. It was targeted by the police with nimrod raids. Four properties on this street got raided, and in turn were either evicted or the tenants left before we evicted them". (CS08)

Finally, as the early intervention manager noted, the location of the facilities for young people need to be equally carefully considered as such facilities can also trigger ASB related activities:

"I think the antisocial behaviour increased on the YIP (Youth Inclusion Program) nights as they went into the YIP and came out of the YIP". (CS08)

Perceptions of Crime and Anti-social Behaviour

Alongside actual incidents of crime and anti-social behaviour, the interviewees all expressed an opinion about the importance of countering the fear of crime and ASB:

"It's a mind-set, isn't it? How many people suffer anti-social behaviour in the volume of people? Very few. But how many people perceive ASB? 99%". (CS08)

"Yes, the perception of it [ASB (Anti-Social Behaviour)] is causing problems . . . it puts them off. So I think that's one of the reasons why we're struggling to let [the shop units]". (CS01)

Yet, this fear of anti-social behaviour is having very real effects for some within the neighbourhood. As the environmental services manager identified, the mere fact that young people are congregating outside a shop was seriously affecting the viability of the business:

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"The Chinese chippy, they've had a lot of problems . . . people on the estate don't come down here in the evening . . . You tend to get a gang of kids hanging out outside. In his own words, he's said, 'They don't cause a problem, they're just stood there'. They don't cause him any problems; they just cause anybody passing by a problem" (CS10)

However, the two interviewees with responsibility for crime and anti-social behaviour opined that, when considering physical improvements to neighbourhoods as part of regeneration or other investment strategies, it is becoming increasingly essential to incorporate features which go beyond secure by design to ease the residents' fears of crime and anti-social behaviour:

"I think what they don't take into consideration is practical measures that they should really put in place, like the fences should be high enough. I think they should link. I think they should make it criteria to link CCTV in there from the very beginning and to maintain it".
(CS09)

"Being an ex-police officer, I think CCTV is a prime example. Wherever there's a shop, I feel we must have CCTV". (CS09)

Social Exclusion

Due to the wide scope of 'social exclusion', a number of features have already been commented on elsewhere. However, during the interviews, a number of respondents focused on the importance of combating social exclusion in certain neighbourhoods.

Interestingly, one neighbourhood officer felt that the problems of social exclusion were the result of the social engineering practices historically adopted by local authority housing departments which led to the creation of 'sink estates' where 'problem tenants' would often be allocated:

"Better tenants . . . probably stems back from the council when they used to cherry pick it. So maybe the rougher end would have gone on [Estate A]". (CS05)

Although such social segregation can also be the product of failures within the market mechanism in certain neighbourhoods; as a number of interviewees opined, hard to let

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or problem housing would often attract only people who were already socially excluded, almost alluding to a continuous spiral of decline:

> *"When it was council, you always had a lot of empty properties and areas that you couldn't let out. So those that were desperate probably would go to [estate A]". (CS05)*

As suggested earlier, the root causes of these problems span a number of issues. For example, the rent income manager felt it was simply age related, with those under 25 being more likely to struggle to support their tenancy for various reasons, which can in the main be related to social exclusion:

> *"I think. It was going all the way through and most of the evictions were people under 25, so they have put something in place". (CS07)*

> *"I think the biggest problem we've come across is sustainability of tenancies. That's for quite a number of reasons. It could be down to a lack of education. It could be down to second and third generation of not working, not having an income coming in, bad parenting". (CS09)*

Yet, some of the problems are out of the control of the social housing provider. As the rent income manager alluded to, the service level agreements covering homelessness can lead to increasing levels of social exclusion:

> *"We have a service level agreement with the Local Authority, and I think 80% of nominations and homeless people have to be...They move town. We've seen a bit of this through visits in places like [neighbouring town] and stuff. They must move from one council to another. To avoid detection". (CS07)*

Although the social issues confronting some residents are clearly outside the scope of the study, with no physical improvement work likely to occur, a number of the interviewees did suggest that, in some situations, housing type and housing mix did contribute to the problems:

> *"We have a high proportion of those flats anyway. A lot of the time, these people are unemployed. They've come out of the care system, and that's why . . . these people just don't want to engage. They're*

involved with groups of people who are undesirable or involved in some sort of criminal activity". (CS06)

"The one and two bedroomed flats certainly represent a problem - they attract low income, very high benefit dependency tenants and ex-offenders, who bring with them, high rates of crime and offenders. So it was dealing with them". (CS08)

"They [the flats] all became very, very poor quality, low economic value. Then all the problem tenants that used to be in [housing association] and the Council were displaced to there. They just literally let the place run down. The properties were disgusting". (CS11)

Access to Facilities and Services

The notion of community, from the perspective of access to facilities and services, was a clear underlying issue but it did not dominate any of the interviews. This would suggest that ensuring tenants have access to facilities and services within their own community was perhaps a bi-product of neighbourhood improvement and regeneration rather than a central focus:

"The other thing that we are actually looking at is the commercial element, which is bringing in private investments through, whether it's a small supermarket in the middle of an estate ..." (CS01)

"As an organisation, we've gone a long way in that we've provided services which are absolutely exemplary". (CS07)

"The neighbourhood is three minutes from the town centre by foot. So you've got the new Asda, the Lidl, Aldi, Iceland. You've got the leisure centre literally two minutes down the road". (CS08)

However, as the early intervention manager asserts simply providing such facilities would really only be part of the solution. It will fall to the residents to ensure that the shops remain viable:

> *"Quite a nice area, but they're struggling to attract customers. So shops are suffering custom, ergo the shops don't want to be there. But society wants them in the community". (CS08)*

Yet, the financial manager suggested that the provision of facilities and services by the social housing organisation extend beyond physical community assets, with the provider offering additional support services to residents:

> *". . . We've got benefit advisers here, housing officers. They go through the whole process. Make sure you sign on for gas, electricity. All the other benefits are put in place for them. We've got support officers so whenever you need assistance we're here. There's nothing that's not available". (CS06)*

Importantly, for estate improvement and regeneration investment, it was clear that providing play space and services for young people remains an important feature of a sustainable neighbourhood:

> *"We provide climbing frames, and rocks to create the bike track down and then you've got different things round the back for younger kids". (CS01)*

> *"You have the community centres with I think one night a week youth club. But for the other time, they say, 'You've got to go to [another neighbourhood]'. So you've got five neighbourhoods all supposed to use one community centre. However, the kids won't mix, causing gangy type problems". (CS08)*

> *"They've all got skills. It's just the amenities they don't have for extracurricular activities. The school don't provide it". (CS09)*

Yet, it was also made clear that the provision of such resources must be aligned to the needs of the residents, not merely based on the assumptions of those designing or specifying the improvements:

> *"It's about finding out what the young people want as well, because there's a lot of things we've put in place over the years that, 'Oh, we know what they want', and we put it in place and it's not actually*

what the kids want so it doesn't get used and it's a waste of resources". (CS09)

Pride in the local community

The development of the community, of which community pride is an essential element, is central to both the social housing movement and from a policy viewpoint for sustainable communities. It is therefore essential that any physical intervention within the neighbourhood contributes to this wider agenda.

Measuring pride in the neighbourhood or community is, however, invariably difficult. The interviewees opined that pride manifests itself through a commitment to the community, which can be measured by either length of tenancy or a drive to improve the area:

> *"Some of them have been in their tenancies 40 years". (CS05)*

> *"There is a tenants' group in this area, and they are putting in for*
> *funding to create a huge patio area in the middle". (CS09)*

Others, however, advocate that pride in the community is exhibited by the residents' willingness to invest in the appearance of their property, and therefore of their neighbourhood:

> *"The people down there seem to look after it and take a little bit of*
> *pride in their area". (CS10)*

> *"The people and the attitude of the people, they seem to be committed*
> *to the community". (CS11)*

> *"We have a number of Polish families who've come in onto (named)*
> *Road and they all seem to come in and take pride in where they live,*
> *and put money and effort into the gardens and houses". (CS11)*

It was suggested by one of the neighbourhood officers that, once one or two people start to exhibit an interest in their neighbourhood, it then creates a snowball effect, prompting others to re-evaluate their own level of community pride:

> *"We'd got quite a large number of empty properties all at once, and*
> *we basically were fortunate enough to replace those with decent*

tenants. They've started taking care and pride in where they live. Then
the ones that weren't have started looking after theirs. Sort of like a
snowball effect". (CS11)

As such, direct investment was seen as an important driver of community pride, as it could be the trigger for further small scale investment by residents, or alternatively the motivation needed for them to at least maintain their properties:

"If we invest to improve fences and stuff, the tenant will then usually
start to take care of the gardens better". (CS10)

Community Mix

It is often argued that neighbourhoods evolve to represent the demographics of the population. This was very clear for the social housing provider in this case, although it was also clear that communities often became highly segregated, with subsequent difficulties in terms of political and cultural identities:

"There is quite a big EDL (English Defence League) presence round
here as well, which causes me a problem when I'm trying to let houses
out". (CS05)

"There are quite a large number of people who follow the BNP
(British National Party) live on this estate". (CS10)

"[Estate C] was surrounded by a big BME area community . . . So our
target customers are also from the BME community". (CS04)

It was suggested by both the development manager and head of property management that this segregation often influences the investment proposals put forward for both new build and regeneration activities within existing neighbourhoods:

"If there were a lot of families in the area, with lots of children, that
would have an impact on whether we would decide to put bungalows
on there". (CS01)

"[Estate C] was surrounded by a big BME area community. We have
just done a survey of new customers and the people round there said
they would never move on because there were no three and four bed
houses and they were wanting bigger family housing". (CS04)

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Community engagement

Given the importance that the organisation places on the *community*, it is unsurprising that they place a strong focus on community engagement when considering potential investment projects:

> *"We have community day projects. We want at least one large scale project per year, and all employers will donate at least two hours of work on a community initiative. We've already started last night by spending five hours with the community which is our, that's per hour times whatever, which is put back". (CS01)*

> *"ENCAMS (Keep Britain Tidy: Environmental Campaigns) do a monthly estate inspection. They invite tenants to come along with them, but very few do". (CS03)*

Indeed, the development manager suggested that the overall community benefit of one £4m affordable housing development was estimated to be in the region of £850,000:

> *"We're saying what we're going to do is that we're going to put £850,000 of value back into the community. How we're going to do that is if you employ somebody, so you look each year to host a programme taking on 15 candidates each term. So they will do things like remediation on the ground, bricklaying, plastering, roofing, whatever". (CS01)*

Feature 6: Governance

The final major theme emerging from the interviews was the need to ensure that strong communication links exist with the organisation's customers. This presents somewhat of a paradox, given the organisation's strong demand that tenant representatives were not be involved directly in the research. The interviewees collectively highlighted the importance of consultation and communication with their tenants, together with the importance they attach to the existence of resident groups. The final emergent theme within this section was the need to capture the views of wider stakeholders, and to look

outside the organisation in some instances to ensure that the community benefit is embedded.

Tenant Consultation

The value of incorporating the views of tenants in the appraisal of any form of stock investment is a fundamental underlying feature of social housing. As such, the majority of the interviewees expressed the importance of consultation:

> *"So, we are going to draw a plan up and go, in consultation with the community, to say, "Look, you are not satisfied with this neighbourhood. But what would make you satisfied?" (CS03)*

> *"It's about finding out what the tenants want as well, because there's a lot of things we've put in place over the years that, 'Oh, we know what they want', and we put it in place and it's not actually what they want". (CS09)*

> *"Leaflets that we sent out to inform the residents of plans and progress on our schemes, no matter what they are". (CS10)*

Whilst the development manager asserted that tenant feedback was often the primary driver of intervention, before moving on to consult the tenants about how best to deliver the desired improvement:

> *". . . Looking at how we can improve the area. So we work with housing management, because [housing management will] have the information from the resident groups to say, 'We want to see green spaces here. We don't want to see new housing, we want to see A, B and C'". (CS01)*

Consultation is not, however, just for the organisation. They contractually oblige contractors also proactively to engage in resident consultation:

> *"Our contractors have to include the community, residents; they have to do consultations". (CS01)*

Partnerships

The organisation has also realised that, to deliver community based benefits to their tenants, they must often engage with external stakeholders such as the local authority and other organisations to ensure that wider issues such as employment are comprehensively dealt with:

> *"The other thing that we are actually looking at is the commercial element, which is bringing private investments through, whether it's a small supermarket in the middle of an estate, which we would then say 'Well, if you're going to do that, we want you to work with the council in providing a nicer gateway to get to your supermarket which enhances the area as well'. We would work with the council to make sure that that happened on our estates". (CS01)*

> *"It's a building that was utilised by the council, which is no longer valuable for them, because of the cuts in funding, so it's going to be an empty building. So we are looking at pairing up with [training company] to provide training for people". (CS02)*

However, partnership working is also essential to the delivery of regeneration and new development projects, with the organisation embedding social benefit into the procurement process, through key performance indicators relating to, for example, the creation of employment opportunities, or the use of social enterprises:

> *"Our investment programme we procure require contractors to take on two apprentices for every £1m we give then so it's built into the fabric of what we're trying to do". (CS04)*

> *"Rather than using our existing procurement route using a local SME (Small to medium sized enterprise) and developing that business on the back of him tacking trainees on which might be able to recruit people from that estate to get work". (CS04)*

Resident Groups

Tenant groups are integral to the social housing sector. Active tenant participation is often facilitated by strong local tenant groups. Additionally, they can act as useful conduits for the communication of information as part of the appraisal process:

"The 2000 Centre is a tenant's base. So it's all volunteers. The Tenants Association work for them. They do a lot of good in the community and a lot of work, putting on events, trips out for the children, and so on. The one next door is actually hired by Sure Start, with the council, and they run various groups in there". (CS11)

"We have the Tenants Association who live out on the estate. They are obviously scattered about the estate. In a way, they're like Neighbourhood Watch. Everything that's going on, they're aware of. I work very closely with them". (CS11)

The role of such tenant groups is, however, not just focused on communication. They are also seen as making important contributions in terms of bidding for funding for community projects and also, in some more problematic neighbourhoods, the chair of the tenant bodies may be invited to interview prospective tenants to appraise their suitability:

"That's a big waste of space [a large open area of lawn] really, but I don't think you can build on it. There is a tenants' group in this area, and they are putting in for funding to create a huge patio area in the middle". (CS05)

"A group of mums from the neighbourhood have started an action group up for funding and different things". (CS05)

"[Estate A] is slightly different in that we have the panel interview, where it's myself, and the head of the tenants' association who interview them at the 2000 Centre, in the centre of the estate. We ask similar questions, get similar details but we have greater, I won't say powers, but say-so over whom we accept and whom we don't". (CS10)

5.3.2 Mapping the Interviews

The emergent model of sustainable development indicators for social housing projects comprises six headline features of sustainability that are deemed to be significant at the neighbourhood level (Figure 5.2).

Figure 5.2: Key Segments of a Sustainable Social Housing Community

In addition, the 49 sub-nodes of sustainability, shown in Table 5.4, developed through repeated open and axial coding of the data further populate the model. This process identified a number of connections between both the main categories and the sub-categories of sustainability, evidencing clear similarities and the overlapping of some aspects of sustainability, and reaffirming the sense of complexity within the emergent model, which will significantly affect the design of the conceptual framework.

Built Environment	Local Environment	Local Economy	Market Dynamics	Community	Governance
Energy Efficiency	Off road Parking	Private Rental Units	Average tenancy length	Community centres/facilities	Partnership Working
Housing Balance	On road parking	Tenure Mix	Number of new tenancies	Social Exclusion	Tenant Involvement
Property Size	Estate design and layout	Provision of Local Shops	Number of transferred tenancies	Mix of community	consultation
Maintenance expenditure	Estate lighting	Benefit dependency levels	Number of applications	Services for young people	
Regulatory Compliance	Derelict land	Unemployment levels	Refusal to select neighbourhood	Fear of Crime	
Property Condition	Garden upkeep	Employment opportunities	Number of terminated tenancies	Fear of ASB	
Void Expenditure	Upkeep local environment		Prevalence of vacant properties	Access to support services	
	Upkeep public spaces		Waiting List Length	Community spirit	
	Littering, Dog Fouling etc		Rejections for accommodation	Level of Anti-social behaviour	
	Boarded up and abandoned properties		Void Periods	Community pride	
	Extent of fly-tipping			Crime statistics	
	Estate appearance				

Table 5.4: Emergent Nodes of Sustainability

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5.4 Comparison of the emergent model and the theoretical framework

Taken together, the various strands of literature evaluated for the construction of the theoretical framework have made a significant contribution to our understanding of sustainability. Yet, the *policy-centric* nature of their development, drawing from a wide range of source materials, has resulted in a range of variables so comprehensive that any attempt to implement them at the level of either the individual project or neighbourhood would prove almost futile. This leaves the social housing provider with a difficult choice regarding which aspects of the guidance are most relevant and which should be incorporated or rejected. In an attempt to overcome these limitations, the six main categories of sustainability, together with the underlying 163 sub-nodes of sustainability were exposed to consultation with key stakeholders drawn from within the social housing organisation, to refine the model into an emergent view of sustainability, which would be *project* or *neighbourhood centric*.

The comparison of the emergent model with the analysis of frameworks, presented in the theoretical framework developed in Section 5.3, confirms the assertion made in Chapter 4 that a gap exists between policy and practice. The analysis highlighted that the various policy frameworks bear a strong resemblance to the global definition of sustainable development. That is not to assert that the practical delivery of sustainability through neighbourhood level improvement projects should not be guided by policy. The findings do however evidence a clear disconnection between the understanding of sustainability by those involved with the delivery of projects, or the neighbourhoods within which these projects will be undertaken and the demands of the policy framework. Observing similar levels of disconnection, Carter and Fortune (2008) alluded to the transformation of comprehension which occurs between policies and practice. Although offering no rationale for this phenomenon, they did nonetheless opine that the professionals' interpretation of policy is an important influence on the way in which sustainability is delivered at project level.

This work, however, challenges this view with a comparison between the theoretical and emergent frameworks, evidencing a number of *neighbourhood centric* features such as *play areas/equipment* and *resident communication* correlates, whilst other,

higher-level *policy centric* features, such as *the percentage satisfied with location as a business destination* and *improvement in parks and open spaces*, are discounted, suggesting that social housing professionals construct a view of sustainability from their interactions with the neighbourhood, which invariably leads to a modified, *neighbourhood* or *project centric* view of sustainability.

5.5 Chapter Summary

Collectively, the theoretical and emergent view of sustainability helps to clarify the phenomena of sustainable development and sustainable communities, together with how they relate to the delivery of social housing projects undertaken by a typical social housing provider. The analysis of both the qualitative data and existing frameworks identified significant gaps in the perception and understanding of built environment professionals working in the social housing sector. The analysis of the existing frameworks developed to further the delivery of sustainability within social housing projects, shown in Table 5.2, has established the theoretical background of sustainability in the appraisal of social housing projects. It can therefore be argued that they aim to link the understanding of sustainable development at the national and global level to the delivery of sustainability through the implementation of housing projects.

The semi-structured interviews held with key staff drawn from across the case study organisation highlight issues that are of importance to individuals at the project level. It is this aspect of the research that was used to develop a project-centric understanding of how sustainable benefit can be delivered through social housing projects. The emergent model of sustainability will now form the basis for developing a framework for evaluating the sustainable benefits of public sector housing projects.

Chapter 6 Developing a Conceptual Framework for the Sustainable Benefit Evaluation of Social Housing Projects

6.1 Introduction

Building on the features of sustainability identified in Chapter 5, this second stage of the case study research, undertaken with the same organisation, uses the features of sustainability identified in Chapter 5 as a base from which to develop a decision support tool for the appraisal of potential asset stock modernisation or regeneration projects. Developed using Edwards' seminal SMART decision analysis technique, the tool provides a framework for making the value benefits explicit to both those involved in the decision making process and to the other stakeholders who are routinely consulted about such schemes. The chapter builds on the earlier literature review by explicitly justifying the need for the research. The underpinning theoretical base for the work, which is grounded in economic theory is highlighted, before the various stages involved in the development of the conceptual framework are described.

6.2 Justification for the research

The exploratory interviews and subsequent large scale mapping of the state of the art in terms of sustainable benefit evaluation identified the significant differences between government policy relating to the incorporation of sustainable development and its actual interpretation and implementation in practice throughout the UK social housing sector. The research further identified that, despite calls from academia for a paradigm shift away from tools limited to the evaluation of a scheme's economic merit, holistic sustainability appraisal tools are still seldom used. Ultimately, the goal must be to develop a conceptual framework which meets the government's policy objectives relating to the delivery of sustainable communities whilst at the same time allowing the organisation to impose budgetary restrictions on the potential outcomes,

thus demonstrating value for money. The literature review identified a number of existing tools which have been developed in an attempt to assist decision makers to take a more holistic view of potential projects. Yet, the limitations of these tools suggest that further refinement and development would be required before the modification to practice proposed above can be achieved.

This assertion is, however, not a recent one. As early as 1981, academics where identifying the limitations of economically led approaches to option appraisal. Bell (1981), critical of the earlier work in the field, argued that decision making should be reflective of the social and environmental importance of a proposed scheme, not just its economic merits, asserting that investment decisions in the housing arena should be based on a more holistic evaluation of the scheme's wider benefits to the community, allowing social housing professionals thereby to reach an informed decision based not only on the anticipated financial resources required, but also on the outturn social and environmental benefits generated. However, Bell failed to provide sufficient detail of the social and environmental attributes that were likely to be significant to the decision, nor did he articulate how the decision evaluation process would be implemented. These omissions severely limited the model's applicability, resulting in near zero change to existing practice.

Whilst the conceptual SHIFT (Sustainable Housing Indicators using Fuzzy-Set Theory) sustainability decision support tool, developed by Li and Shen (2002), attempted to overcome a number of these limitations, focused as it was on the Hong Kong housing market, the framework adopted fuzzy-set theory as the basis for identifying and selecting the preferred level of refurbishment through the appraisal of a number of sustainability indicators. However, the geographical and technical differences between the respective housing stock of Hong Kong, which is predominantly high rise apartment buildings, and the UK, which is predominately low rise family housing, would result in the model needing significant refinement before it could be implemented, that is assuming that the built environment professionals can overcome the difficulties created by the complexity of the model in the first place.

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In their later work, undertaken on behalf of the National Housing Federation, Treanor and Walker (2004) attempted to advance Bell's seminal work by providing guidance on how neighbourhood sustainability could be evaluated. The authors proposed 85 standard indicators of neighbourhood sustainability together with a simple analytical framework through which each of the variables could be evaluated and quantified. Although advancing Bell's earlier research, through the provision of a detailed decision matrix and explanation of utility weighting methodologies, the work overcompensated for Bell's failure to provide guidance on the critical socio-economic and environmental variables that were likely to be critical to the final decision, with the authors instead compiling a list of 94 *project* and *policy centric* indicators identified by evaluating existing data from five large social housing providers. However, the work failed to articulate the process by which potential variables from the list should be selected or indeed if all 94 variables such be considered, resulting in a situation whereby the user is left with the difficult task of deciding which social, economic and environmental aspects were the most relevant and which should be incorporated or rejected.

Although the doctrinal work of Carter (2005), funded by the Royal Institution of Chartered Surveyors, and undertaken in cooperation with housing association delivery teams, evidenced the start of the move towards sustainable decision processes in the procurement of new build housing, it failed to evaluate the potential application of the model to projects relating to the existing housing stock, where some aspects of sustainability, such as site selection, would be unimportant.

Finally, Yates' (2006) research, funded by the BRE Trust, provided the closest framework for the delivery of what Fortune (2007) termed sustainable benefit planning. The framework focused on the pre-1919 terraced housing stock which had been targeted for regeneration under the government's flagship HMR fund. The framework evaluates the financial expenditure associated with various potential intervention strategies, whilst also defining the limits, in terms of conservation, environment, and local economic and social needs, which need to be considered when appraising project viability. However, the framework that Yates proposed represents a refinement of the BRE's Eco-Homes XB environmental appraisal

methodology. As a result, the sustainability features evaluated bore a strong environmental dominance. When applied in a social housing context, this bias may result in the selection of an investment strategy that exhibits a strong environmental benefit yet fails to deliver the desired socio-economic benefit.

From the short review above capturing some of the limitations of the existing literature, it is clear that further work is required if a framework facilitating sustainable benefit evaluation is to be developed. Building on the gaps in the literature identified in Chapter Two, and the limitations of the existing frameworks again summarised here, this chapter reports on the development of a sustainable benefit evaluation framework for use by built environment professionals looking to appraise social housing interventions against multiple attributes rather than against economic viability alone. Importantly, the framework builds on the combined earlier work of Bell (1981), Treanor and Walker (2004) and Yates (2006) to present a comprehensive group decision analysis tool which allows the user to appraise both the sustainable benefit and financial viability of refurbishment projects.

6.3 Theoretical foundations for the Framework

In his doctoral work, Green (1996) provides a detailed commentary on the debate within academia and practice regarding the role of 'value' within the project environment. In his commentary, Green asserts that the concept of *utility* sits at the centre of this argument. Despite the fact that Green's work asserts how design utility can be maximised to ensure that the client receives the maximum value from any proposed design solution, rather than simply viewing the building through a financial lens, whereby the cheapest solution is constructed irrespective of whether it presents value for the user, the underlying principles of Green's work relate well to the thesis, developing the concept of utility maximisation which is becoming increasingly embedded in public procurement policy through the medium of *value for money*. This resulted in a number of researchers seeking to develop toolkits which, through the practical application of utility theory, help practitioners to translate policy

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rhetoric into practice by demonstrating compliance (Phillips, 2007; Wilson *et al*, 2012). Although this thesis does not examine the problem of value-for-money *per se*, the work is nonetheless concerned with maximising the benefits resulting from social housing asset management investment. As such, it is reasonable to suggest that the conceptual model should be underpinned by the normative ethical philosophy of Bentham and Mill together with the theories of utility and decision making. As such, the purpose of this section is to establish the theoretical background to utility theory and the subsequent development of multi-attribute decision theory.

Utility Theory

Although the essence of the utility theory of value has been traced to the 13th century 'scholastic pioneers' (Blaug, 1997), the philosophy of utilitarianism is usually accredited to Jermey Bentham. The initial normative ethics theory proposed by Bentham was expanded to include the utility concept of John Stuart Mill. Collectively, the utilitarian philosophers interpreted the goal of every human activity as being either a quest for pleasure or the avoidance of pain. It was therefore argued that every commodity or action could be considered in terms of its pleasure or pain giving properties, these properties being referred to as the *utility* of the commodity (Edwards, 1954). It was further asserted that people would tend to act in a manner which maximises their utility.

The view of utility provided by Bentham and Mill was further advanced in the social science of economics through the development of the neoclassical theory of consumer demand, developed from the theory of *marginal utility*. The initial distinction between total and marginal utility has been credited by Blaug (1997) to Lloyd and Longfield in 1834. However, it was the work of Carl Menger, Leon Walras and William Jevons which heralded the so called marginal revolution (Green, 1996). It was this important distinction between total (satisfaction the consumer receives from all goods) and marginal utility (satisfaction the consumer receives from one additional unit of good), however, which sat at the core of the neoclassical model of consumer demand. Nonetheless, the theory presented economists with the

difficulties of attempting to quantify choice. Whilst the 'law of diminishing marginal utility' was often advocated as the basic axiom, as it was argued the 'law' concerned the marginal utility derived by a consumer from each additional unit of good, whereby as the consumer buys more units, they will receive marginally less utility from each, some economists questioned the scientific objectivity of the theory, leading to the proposition of the alternative 'revealed preference hypothesis', which underpins current demand modelling. Even so, the base theory still makes an important contribution to decision theory, through the medium of multi-criteria analysis, whereby utility is seen as an important measure of choice.

Simplified Approaches to Multi-attribute Utility Theory

The field of multi-attribute utility theory (MAUT) is a well-established branch of modern decision theory (Green, 1996). Although it is not within the scope of this thesis to provide a detailed commentary on this theory, the MAUT technique is primarily applied to riskless decisions (Garnham and Oakhill, 1994), which are deemed to be those which are modelled following the principles of neo-classical economic theory, which advocates that the selected outcome will be the one which provides the maximisation of utility for the decision maker, as opposed to the decisions which conform to the conditions outlined in the seminal work of Von Neumann and Morgenstern (1947), relating to the application of game theory, whereby the implications of risk and the decision makers' willingness or otherwise to accept risk within the decision environment are also acknowledged.

Given the limitations of traditional Multi-attribute utility theory documented in Green's work (1996), together with the realisation that the decision making process does not conform to a positivist view of reality, whereby a fixed underlying value structure exists and simply awaits discovery, theorists have acknowledged the possibility that the process of investigating the value structure associated with the decision was ultimately likely to influence it (Green, 1996:86). The importance of this shift in perspective is reflected in the tendency to refer to decision analysis which aims to help decision-makers to understand the nature of the decision environment rather than decision theory, which aimed to find mathematically optimal

solutions. This alternative view, alluding to decision support as opposed to decision making, sits at the core of this thesis, which aims to provide a framework to sit alongside the existing financial techniques for facilitating enhanced decision making. This shift or arguably reduction in expectation lead to the generation of more simplistic and arguably more user friendly approaches to decision making, which led to a number of simplified approaches to decision analysis. The Simple Multi Attribute Rating Technique (SMART) and Analytical Hierarchical Process (AHP) are, arguably, the two most common of such techniques and the most suitable to the specific research problem.

SMART, proposed by Edwards (1977) differs significantly from the mathematical approaches to decision evaluation. Edwards alluded to this difference by asserting that the SMART methodology was specifically designed for application in a social decision context. where the methodology aids the decision maker or group of decision makers to reach a decision rather than making the actual decision, whilst the initial iteration of the technique proposed a ten stage process for the evaluation of potential decisions. Edwards *et al* (1988) later published a simplified second iteration, transforming the technique into a four stage methodology. Stage one requires the decision maker to elicit a value structure for the problem, through the construction of a value tree identifying the decision attributes. The second stage of the process transforms the value tree into a hierarchical model through the allocation of a numerical weighting to each branch of the value tree. The third stage then consists of the elicitation of single-dimension utility functions for each attribute. The final step is to aggregate each of the utility functions into an overall utility function. The alternative with the highest utility score becomes the recommended solution to the decision problem. Whilst the weighting and scoring exercise is highly subjective, it is possible to introduce a fifth sensitivity testing stage to the process, although this is outside the work of Edwards *et al* (1988) it is often seen as crucial depending on the nature of the decision problem and the level of risk involved.

A further approach worthy of consideration is Thomas Saaty's (1980) Analytical Hierarchical Process. This technique uses procedures for deriving the weightings and scores achieved by alternatives which are based on pair-wise comparisons

between criteria and options. This is a process, by which each criterion is compared with every other criterion within the individual pairs. Whilst Saaty's approach is similar in its starting point to the value tree adopted by Edwards, in that the technique centres on the use of a hierarchy of objectives. Attributes are then considered in pairs, whereby the decision maker is required to state if one is more important than the other. They are then required to specify if it is: weakly more important; strongly more important; very strongly more important or finally absolutely more important. The verbal response is then interpreted numerically and used to express the ratio of the weights of importance of the two attributes.

Whilst AHP has been applied to a number of construction decision problems, including those highlighted in the work of Abdullah and Egbu (2011), seeking to appraise potential industrialised construction techniques, Latorre and Riley (2010), evaluating critical success factors, Phillips (2007), who focused on contractor selection, and finally Fong and Choi (2000), who used the model to appraise pre-qualification questionnaires, to name just a few studies. However, a common feature of all of these studies was that the research problem allowed the researcher to identify a small number of headline criteria against which solutions could be evaluated. Latorre and Riley (2010) assert that such a situation is essential to the application of AHP as the technique ranks alternative courses of action based on the decision makers' judgements relating to the extent to which the options identified meet each criterion (Nydick and Hill, 1992). Despite the dominance of AHP within the CM research, its application to the decision problem presented in this thesis is more problematic. Given the number of sustainability criteria identified, together with the time commitment needed on behalf of the research participants, as a result of the number of pairwise comparisons required to develop the hierarchy (Hajkowicz et al, 2000; Macharis *et al,* 2004), it was decided to adopt the SMART methodology for this research. Although SMART is used far less in construction, Green's (1996) work in the field of value management evidences its suitability for project level appraisals.

6.4 Research Approach

In designing the methodology for the development of the conceptual framework, the author is acutely aware that decision-makers will often have different views regarding the importance of a criterion, so it was necessary to use a recognised weighting methodology to determine the relative importance of each attribute identified in Chapter 5. When a suitable expert participation group is applied to this methodology, a solid foundation is established to support a decision (Hamilton et al, 2007). 'Delphi' is a systematic, intuitive forecasting procedure, used to obtain, exchange, and develop informed opinion on a particular topic. The objective of a Delphi study is therefore to "*obtain the most reliable consensus of opinion of a group of experts...by a series of intensive questionnaires interspersed with controlled opinion feedback*" (Linstone and Turoff, 1975:54), in this case, the important social and local economic phenomena when considering stock investment options. This process has the aim of allowing the "experts" involved to arrive at a consensus on what sustainability means for social housing at that level, with the objective being to obtain a statistically significant consensus among a group, based upon their knowledge and experience, and is implemented through a series of iterative questionnaires, combined with controlled, anonymous feedback loops (Quade, 1970). In addition, the study will also ask the 'experts' to score the phenomena during each iteration, allowing both a consensus in relation to the phenomena together with their relative importance values to emerge, which Meadows (1993) asserts will be critical to any indicator-based comparative urban sustainability assessment model, as the quantifiability of the comparative sustainability levels is the only way of selecting between the available options.

6.4.1 Selecting Participants

The number of Delphi participants recommended in the literature varies from ten to 50 experts (Turoff, 1970), nor does the existing literature reach a consensus on the suitable methods for gathering data from the expert Delphi group. However, it is considered that an individual who is highly skilled, with specific, specialist expertise

about a subject, is an appropriate Delphi expert (Oh, 1974), assuming that the individual is willing to engage in a process whereby they may need to revise their views when presented with new information (Pill, 1971). Furthermore, it is suggested that a heterogeneous group provides advantages in the capture of diversified, unbiased knowledge (Hon *et al*, 2011).

With the assistance of the Director of Housing, a sample of 30 senior and middle managers was drawn from across the organisation, with each department represented. All participants were selected on the basis of their experience and seniority which, it was felt, would give them a sufficient understanding of the wider sustainability requirements of regeneration and other asset improvement projects undertaken by the organisation, whilst also allowing them to demonstrate an in-depth knowledge and understanding of their own specialist field. Emails were initially sent by the Director of Housing to explain the purpose and aim of the study and to confirm the organisation's involvement. Second rounds of individual invitations were subsequently e-mailed to all 30 participants by the researcher again, explaining the scope and purpose of the research, outlining the ethical considerations and asking them to confirm their willingness to participate. All 30 managers agreed to participate in the research and duly returned signed consent forms.

6.5 Development Stage One

The first stage of development in the decision tool involved implementing the Delphic study within the organisation to rank and weight the features of sustainability identified through a series of semi-structured interviews reported in Chapter 4.

6.5.1   Questionnaire One

The six main groupings and 49 nodes of sustainability, identified in Table 5.4, form the basis for the first iteration of the Delphic study. Using a five point likert scale, the respondents were asked to score each identified aspect of sustainability based on

their perception of its importance for the delivery of sustainable benefit. Although the six main features have not been ranked, the 49 sub-features have all been scored.

The questionnaire shown in appendix 3 was designed to take a maximum of ten minutes to complete. This aspect is important because it has been shown that participation in research is influenced heavily by the amount of effort that is required on the part of the participant. To ensure that the questionnaire was as simple to complete as possible, it was issued in electronic format (Carter and Fortune, 2004) via a commercially available online survey application. Each of the six themes was fully colour coded to ensure that the attention of the respondent was maintained. The first page of the questionnaire carried the logos of the university and the case study organisation, accompanied by a full explanation of the purpose of the questionnaire. Subsequent pages presented the six main categories in alphabetical order to ensure that the respondents did not feel influenced, with each separate page representing an independent section of the questionnaire. As a result, the majority of respondents completed the full questionnaire.

6.5.2 Results: Round One

The first questionnaire produced 29 responses. This constitutes a response rate of 97%. This was achieved following two rounds of e-mails sent to all recipients via the Director of Housing to evidence the organisation's support for the research process.

The responses from the survey were then downloaded from the survey site in Excel format before being imported into SPSS. The data were analysed using Kendall's W test both to compare the means and identify the level of agreement between the respondents. This is critical, as consensus is essential to the application of the SMART technique. The Kendall's W provided the mean score for each response and the coefficient of concordance then demonstrates the level of agreement present in the full range of scores. The closer the score is to 1.000, the greater the agreement within the group.

Feature 1: Built Environment

As Table 6.1 shows, the issues prioritised by the group relating to the built environment represent a broad understanding of the importance of the physical housing stock to the evaluation of sustainable benefits. The three highest ranked features of sustainability identified reflect both the current political drive to deal with energy usage and the importance of eradicating fuel poverty within social housing, whilst also reflecting the needs of the community during the occupation cycle. The least important issue was *regulatory compliance*, which potentially reflects the organisation's strong compliance with the now 11 year old Decent Homes standard. However, the rankings are based on a relatively low coefficient of concordance; as such, this ranking is not especially significant for these sub-nodes at this stage.

		Mean Rank	Kendall's W (Significance)
1	Energy efficiency	2.08	
2	Housing balance	3.33	
3	Property size	3.90	
4	Void expenditure	4.02	
5	Property condition	4.77	
6	Maintenance expenditure (£/yr)	4.88	
7	Regulatory compliance	5.02	0.305 (<0.01)

Table 6.1: Built Environment Sub-Node Rankings

Feature 2: Local Environment

The ranking of Local Environment categories, shown in Table 6.2, again received a low degree of agreement amongst the respondents. Very surprisingly, the two parking related categories were ranking highest, with '*off-road parking*' and '*on-road parking*' identified as the most important benefits to the community from any investment. Despite the literature suggesting that issues such as graffiti, littering and the maintenance of open space are usually dominant when considering the sustainability of neighbourhoods, the least important issue was *estate appearance*, which is often seen as critical to the design of new housing developments. This appears to validate the view expressed by some of the interviewees that the provision

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of social housing is primarily an allocation service. As such, they place minimal focus on attracting customers in the same way as private housing developers, who see kerb appeal as critical to the success of schemes.

		Mean Rank	Kendall's W (Significance)
1	Off-road parking	3.25	
2	On-road parking	4.85	
3	Estate design and layout	5.37	
4	Lighting levels	5.73	
5	Presence of derelict land	6.12	
6	Garden upkeep	6.48	
7	Upkeep of local environment	6.58	
8	Upkeep of public spaces	7.29	
9	Littering, dog fouling, graffiti etc	7.71	
10	Boarded up/abandoned properties	7.75	
11	Extent of fly tipping	8.10	
12	Estate appearance	8.79	0.270 (<0.01)

Table 6.2: Local Environment Sub-Node Rankings

Feature 3: Market Dynamic

The ranking of categories relating to the commercial success of the organisation, shown in Table 6.3, are hardly surprising. As would be expected, *average tenancy length* and *number of new tenancies* are ranked highest, as these are likely to be key to commercial success, with minimising churn and thus reducing lost rent etc. essential to the viability of the estate. Yet, the ranking of *void periods* and *rejections* was surprising, as these are identified by the Department of the Environment Transport and Regions (1999) and Olubodun *et al* (2006) as key indicators for sustainable communities.

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		Mean Rank	Kendall's W (Significance)
1	Average tenancy length	4.33	
2	Number of new tenancies	4.42	
3	Number of transferred tenancies	4.46	
4	Number of applications	5.08	
5	Refusal to select neighbourhood	6.12	
6	Number of terminated tenancies	5.98	
7	Prevalence of vacant properties	6.19	
8	Waiting list length	6.25	
9	Rejections for accommodation	6.27	
10	Void periods	6.38	0.118 (<0.01)

Table 6.3: Market Dynamic Sub-Node Rankings

Feature 4: Local Economy

The ranking of the local economy nodes, shown in Table 6.4, has again received a low degree of agreement amongst the respondents. *Private rental units* and *tenure mix* were ranked most highly. These issues are specifically targeted within the social housing agenda for improving neighbourhood sustainability as high levels of private renting, together with mono-tenure housing, can be suggestive of a socially excluded and increasingly unpopular neighbourhood (Fitzpatrick and Pawson, 2007). Their appearance at the top of the ranking is significant in that the respondents have recognised and agree with the level of importance given to these categories within the policy frameworks.

		Mean Rank	Kendall's W (Significance)
1	Private rental units	2.40	
2	Tenure mix	3.17	
3	Provision of local shops	3.48	
4	Benefit dependency levels	3.54	
5	Unemployment levels	3.94	
6	Employment opportunities	4.46	0.212 (<0.01)

Table 6.4: Local Economy Sub-Node Rankings

Feature 5: Community

'*Community Centres and Facilities*' and '*Social Exclusion*' emerged as the top two issues for the main category of Community, as shown in Table 6.5. These categories represent a strong social bias within the benefit evaluation framework. Issues relating to community pride and crime statistics represent the least relevant nodes within this feature, which is hardly surprising as these are the aspects of the community over which the organisation has least control.

		Mean Rank	Kendall's W (Significance)
1	Community centres/facilities	3.37	
2	Social exclusion	4.50	
3	Mix of community	6.15	
4	Services for young people	6.40	
5	Fear of crime	6.58	
6	Fear of anti-social behaviour	6.60	
7	Access to support services	6.63	
8	Community spirit	6.96	
9	Level of anti-social behaviour	7.54	
10	Community pride	7.81	
11	Crime statistics	8.42	0.231 (<0.01)

Table 6.5: Society and Community Sub-Nodes Rankings

Feature 6: Governance

The ranking of the three governance categories, shown in Table 6.6, is the only feature which is not statistically significant, whilst also presenting the lowest level of agreement amongst the respondents. Within this feature, *partnership working* was deemed the most important node, whilst *consultation with residents* was ranked lowest.

		Mean Rank	Kendall's W (Significance)
1	Partnership working	1.20	
2	Tenant involvement	1.46	
3	Consultation	1.54	0.031 (0.157)

Table 6.6: Governance Sub-Node Rankings

In themselves, the results provide an interesting perspective on the views of one social housing provider regarding the sustainability of investment projects and how such projects can result in community benefit. Whilst, in most cases, the results are statistically significant, the analysis of the data using Kendall's W test for concordance nonetheless demonstrates only a low to medium level of agreement between the participants. The aim of the research, however, was to develop a framework for the evaluation of sustainable benefits using the SMART decision support technique. As Edwards (1988) asserts consensus to be an essential pre-curser to the application of the framework, further iterations of data collection were needed. As the first iteration of the weighting and scoring process evidenced a range of opinions relating to how sustainability can be attained through estate improvement and regeneration activities, this position determines that a further iteration of the process is required and a second questionnaire was compiled.

6.6 Questionnaire: Round Two

The results from the first questionnaire were used to create the instrument for the second round of data collection. The design of the questionnaire was amended, moving away from a likert scale scoring system to a ranking system which required the respondent to prioritise each sub-node within each of the six features, placing them in some form of order, as shown in Appendix 4. Each cluster of sub-nodes was arranged from the most important to the least important based on the analysis above to reflect the group's ranking that had resulted from the first iteration of the questionnaire. The subsequent pages of the questionnaire were arranged in the same numerical sequence as used in the design of questionnaire one. To aid the respondents in this second iteration of the survey, the ranking boxes for each sub-node were already ticked to reflect its relative importance. This gave the respondent the opportunity to submit the survey without making alterations. By doing so, they were expressing their agreement with the ranking of the categories.

6.6.1 Results: Round Two

The second iteration of the questionnaire was again issued to the same respondents via the Director of Housing in an attempt to tighten the consensus of opinion on the data rankings. This was critical, given the importance of consensus within the group decision support techniques including that used in this study. The second questionnaire was issued, producing a response rate of 90% (n=26) from the first round respondents, with all respondents completing the full questionnaire. As such, this represented an exceptionally low attrition rate between iterations, strengthening the validity of the final framework. The majority of respondents indicated a total agreement with the ranking of the categories through all sections of the questionnaire. Only three respondents made amendments to the ranking of the sub-nodes. Generally, the ranking established by the group as a result of questionnaire one proved acceptable, resulting in almost complete agreement on the importance of the features of sustainability and their relevance to the evaluation of the project benefit. It was therefore unnecessary to complete further iterations of data collection. A full analysis of the data from the second questionnaire can be found in appendix 7.

6.7 Stage Two: Transforming rankings into normalised weightings

The ranked outputs from the Delphic study resulted in a series of rankings for the various sub-nodes divided across the six features of sustainability. As required within the SMART framework, these individual ranks need to be transformed into weightings for each aspect of the value tree. To facilitate this, the rankings have been normalised by dividing the mean rank by the aggregation of the mean ranks for each feature, as shown in Tables 6.7-6.12.

Feature 1: Built Environment

Ranking data for built environment sub-nodes have been normalised in Table 6.7 below:

		Mean Rank	Normalised Weighting
1	Energy efficiency	6.88	0.245
2	Housing balance	6.00	0.214
3	Property size	5.00	0.178
4	Void expenditure	3.88	0.138
5	Property condition	3.00	0.107
6	Maintenance expenditure (£/yr)	2.00	0.071
7	Regulatory compliance	1.29	0.046
	Total Score	**28.05**	**1.000**

Table 6.7: Normalised weightings for Built Environment

Feature 2: Local Environment

Ranking data for the local environment sub-nodes have been normalised in Table 6.8 below:

		Mean Rank	Normalised Weighting
1	Off-road parking	12.00	0.154
2	On-road parking provision	11.00	0.141
3	Estate design and layout	10.00	0.128
4	Lighting levels	9.00	0.115
5	Presence of derelict land	8.00	0.103
6	Garden upkeep	7.00	0.090
7	Upkeep of local environment	6.00	0.077
8	Upkeep of public spaces	5.00	0.064
9	Littering, dog fouling, graffiti etc.	3.96	0.051
10	Boarded up properties	3.04	0.039
11	Extent of fly tipping	2.00	0.026
12	Estate appearance	1.00	0.013
	Total Score	**78**	**1.000**

Table 6.8: Normalised weightings for Local Environment Sub-Nodes

Feature 3: Market Dynamics

Ranking data for the market dynamic sub-nodes have been normalised in Table 6.9 below:

		Mean Rank	Normalised Weighting
1	Average tenancy length	9.77	0.178
2	Number of new tenancies	9.00	0.164
3	Number of transferred tenancies	8.00	0.145
4	Number of applications	7.00	0.127
5	Refusal to select neighbourhood	6.00	0.110
6	Number of terminated tenancies	5.00	0.091
7	Prevalence of vacant properties	4.23	0.077
8	Waiting list length	3.00	0.055
9	Rejections for accommodation	2.00	0.036
10	Void periods	1.00	0.018
		55	**1.000**

Table 6.9: Normalised weightings for Market Dynamic Sub-Nodes

Feature 4: Local Economy

Ranking data for the local economic sub-nodes have been normalised in Table 6.10 below:

		Mean Rank	Normalised Weighting
1	Private rental units	6.00	0.286
2	Tenure mix	5.00	0.238
3	Provision of local shops	4.00	0.190
4	Benefit dependency levels	3.00	0.143
5	Unemployment levels	2.00	0.095
6	Employment opportunities	1.00	0.048
		21	**1.000**

Table 6.10: Normalised weightings for Local Economy Sub-Nodes

Feature 5: Community

Ranking data for the community sub-nodes have been normalised in Table 6.11 below:

		Mean Rank	Normalised Weighting
1	Community centres/facilities	11.00	0.167
2	Social exclusion	10.00	0.152
3	Mix of community	9.00	0.136
4	Services for young people	8.00	0.121
5	Fear of crime	7.00	0.106
6	Fear of anti-social behaviour	6.00	0.090
7	Access to support services	5.00	0.076
8	Community spirit	4.00	0.060
9	Level of anti-social behaviour	3.00	0.045
10	Community pride	2.00	0.030
11	Crime statistics	1.00	0.015
		66	**1.000**

Table 6.11: Normalised weightings for Community Sub-Nodes

Feature 6: Governance

Ranking data for the governance sub-nodes have been normalised in Table 6.12 below:

		Mean Rank	Normalised Weighting
1	Partnership working	3.00	0.500
2	Tenant involvement	2.00	0.334
3	Consultation	1.00	0.167
		6	**1.000**

Table 6.12: Normalised weightings for Governance Sub-Nodes

6.8. Development Stage Four: Developing a Decision Matrix

The penultimate phase in the development of the conceptual framework was to integrate the features of sustainability identified in Chapter Five, together with the normalised weightings generated as a result of the Delphic study reported above. An

important feature of the SMART methodology is the evaluation of options; this is achieved through the aggregation of individual utility scores or importance weightings. For this to be achieved, three essential ingredients need to be present: importance weightings, some form of scoring approach and, finally, a framework for aggregation which is clear and auditable. The importance weightings have already been determined and normalised through stages 1-3. As such, this stage in the evolution of the SMART framework will develop the scoring and aggregation framework.

Scoring System for the Conceptual Framework

One of the important final stages in the calculation of individual utility weightings is the scoring of each attribute. Whilst this process will be arguably subjective, Green, (1996:210) opines that guidance should be issued in an attempt to make it as objective as possible. Scoring guidance has therefore been provided for all 49 features of sustainability. An example of the scoring guidance for community pride is shown in Table 6.13.

Community pride	Measure	Score
Measured by neighbourhood officer based on number of complaints about the community and other relevant indicators of community pride.	Excellent	80+
	Good	60-79
	Satisfactory	40-59
	Poor	20-39
	Very Poor	0-19

Table 6.13: Scoring Matrix for Community Pride

Within the framework, subjective attributes are measured on a scale of 0-100, where 0 represents the minimum standard (defined as very poor) whilst 100 represents the maximum achievable (defined as excellent). It is usual to assume that each value function is linear, thereby ignoring the possibility of diminishing marginal returns, in the case of objective data available for variables such as re-let periods, maintenance expenditure and energy efficiency. It is essential that the data are converted into measurements based on the 0-100 scale. Again, guidance on how this is to be achieved will be provided to the user.

Aggregation of Utility Scores

The final stage in the development of the conceptual framework is the aggregation of the individual utilities for each decision option. Within the SMART framework, the aggregation can be achieved without the use of mathematical formulae. Instead, a simple decision-analysis matrix, as shown in Figure 6.1, is used, presenting the user with the additional benefit of developing a transparent and auditable decision system. The matrix allows the options to be listed, one per row, with the individual decision attributes identified above each column. The scores are entered into the top left of each interface, with the individual score multiplied by the allocated weighting identified at the top of each column to give an individual utility score which is then aggregated using the end column.

Figure 6.1: Decision-Analysis Matrix (Green, 1997)

To solve the specific research problem, the decision-analysis matrix shown in Figure 6.1 has been modified to allow users to consider the six dominant strands of sustainability. For each feature identified, a decision-analysis matrix has been prepared, as shown in Figure 6.2. A screen shot from the actual framework is shown in Figure 6.5

Feature 1: Built Environment						
	Factors					
	Energy Efficiency	Housing Balance				Total
Weighting of importance	0.25	0.24				1.0
Options						
The various options under appraisal would be listed in these rows						

The factors' score is inserted in the top portion of the box. Below that, the score is multiplied by the weighting is inserted

Scores for each option are totalled together and entered here.

Figure 6.2: Feature Decision Matrix Interface

For each sub-node, the weightings determined above have been added to the decision matrix. In use, it is envisaged that any unnecessary sub-categories will be simply removed during the group discussions when the framework is applied to a specific project. For each of the six features of sustainability a similar scoring matrix will be created, which will then transfer the total individual utility scores to the principle sheet. This is shown in Figure 6.3 and the screen shot from the actual framework is shown in Figure 6.4.

Strategic Sustainable Benefit Evaluation Framework						
	Factors					
	Built environment	Local Environment	Market dynamics			
Overall weighting of importance						
Options						
The various options under appraisal will be listed in these rows.						

Score for each option are totalled. These are then colour coded based on benefits over and above "do nothing"
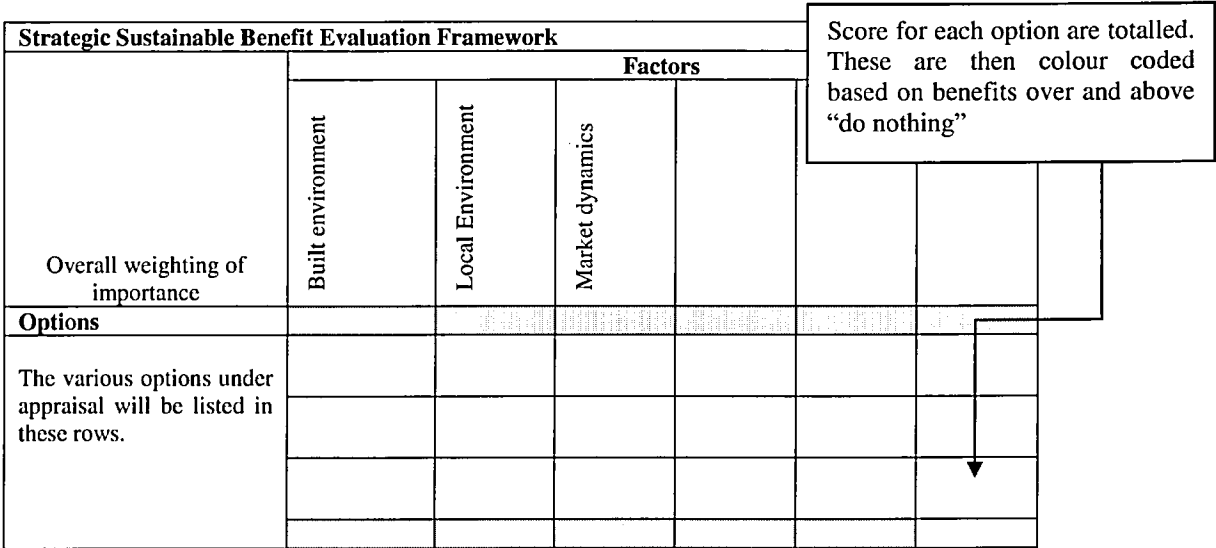
Figure 6.3: Individual Decision Matrix Collection Sheet

Finally, within the spirit of a requisite decision model, it is unnecessary to be overly concerned about the theoretical validity of the additive utility function which is implicit within the use of decision matrices of this nature. The purpose of the exercise is to provide a structured framework for thinking and trying to demonstrate the outcomes of that thought process rather than a normative idealisation. As such, the 'decision model' is perceived to be a *facilitative device* rather than an objective model of reality. Therefore, it is for the Social Provider, in this case the sponsoring organisation, to decide how to move forwards based on the outcome of this process, although the researcher has attempted to capture existing practice, in an attempt to demonstrate how the conceptual framework will be integrated into the existing systems, as discussed in Section 6.7.

SMART Sustainable Benefit Evaluation Framework For Asset Management Projects									
The weightings displayed here have been transferred from the decision matrix for each of the principle 'grouping' features. **Factors**		Built Environment	Local Environment	Market Dynamics	Local Neighbourhood Economy	Community	Governance within Neighbourhood	Overall Total	Traffic Light Indicator (Apply Colours to these boxes based on the scoring outcome)
Options Under Consideration									
Option 1: Do Nothing (Benchmark Option)		0	0	0	0	0	0	0.00	
Option 2:		0	0	0	0	0	0	0.00	
Option 3:		0	0	0	0	0	0	0.00	
Option 4:		0	0	0	0	0	0	0.00	
Option N:		0	0	0	0	0	0	0.00	

Figure 6.4: Conceptual Framework – Main Output page with scores and colour codes.

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Sustainable Benefit Evaluation Framework For Asset Management Projects								
Factors [The group enters sores here based on the scoring advice provided, with scoring ranging from 0-100.]	Energy Efficency	Housing Balance	Property Size	Void Expendature	Property Condition	Maintenance Expendature	Regulatory Compliance	Overall Total
Importance Weighting	0.25	0.2?	0.18	0.14	0.11	0.07	0.05	1.00
Options Under Consideration								
Option 1: Do Nothing (Benchmark Option)	0	0	0	0	0	0	0	0
Option 2:	0	0	0	0	0	0	0	0
Option 3:	0	0	0	0	0	0	0	0
Option 4:	0	0	0	0	0	0	0	0
Option N:	0	0	0	0	0	0	0	0

Finally, the various utilities are aggregated to give an overall score which is transferred to the front page displayed in Fig. 6.4

The score will then be multiplied by the weighting factor to give a score for the sub-node.

Figure 6.5: Conceptual Framework - Example of sub-node analysis for 'Built Environment'

6.9 Aligning the conceptual framework with practice

The final stage in the development of the framework is its eventual integration into the existing practice within the organisation. Although this is clearly outside the scope of this PhD, it is nonetheless important to attempt to evidence how the researcher envisages this process happening in order fully to demonstrate the attainment of the original aim of the research. To assist with this process, the outcomes of the exploratory interviews reported in Chapter 4, together with a series of additional informal interviews held with three senior directors working for the case study organisation at the very early stages of the problem identification, collectively allowed the researcher to develop an understanding of the existing procedures used for the evaluation of a potential asset management process within the case study and other similar organisations.

The initial mapping of the processes used within the organisation depicted in Figure 6.6 evidences the clear separation of *strategic asset management* during which phase the full stock of the organisation is evaluated. This process generates the organisations strategic asset management plan which identifies, *inter alia*, the proposed stock disposal, acquisition, development and maintenance strategy for the forthcoming year or other specified period of time. This strategy is informed by existing information within the organisation, including: tenant satisfaction questionnaires; short and long term market data, including population predications and household formation data; quinquennial stock inspection data; maintenance prioritisation data; and internally developed neighbourhood sustainability indicators.

As part of the strategic asset management process, stock intervention opportunities will be identified along with other aspects of the stock which would be more suitable for 'neighbourhood plans' aimed towards housing management interventions. Looking to those aspects of the stock requiring 'regeneration', during the informal interviews, the Director of Regeneration identified a number of apartment blocks with shared bathroom facilities which, the market data suggest, are no longer suitable, and as such have become difficult to let or, if let, difficult to manage. Such aspects of the stock would be considered for some form of physical intervention.

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However, in developing the business case, the asset investment appraisal requirements are fundamentally driven by the financial case for intervention (see Figure 6.6). In this example, the Director of Finance showed the researcher a comprehensive Excel spreadsheet which evaluated costs versus income over a 30 year period to evaluate the financial implications. Yet, he attested that the lost rental (as some form of remodelling would be the eventual outcome) would mean that it was difficult to justify the project to the board, even though the Director of Housing and Regeneration felt that the benefits to the neighbourhood (reduced crime, reduced turnover, etc.) would make the development viable. Yet, they identified this as only one example of the longer term difficulty of evidencing project benefit.
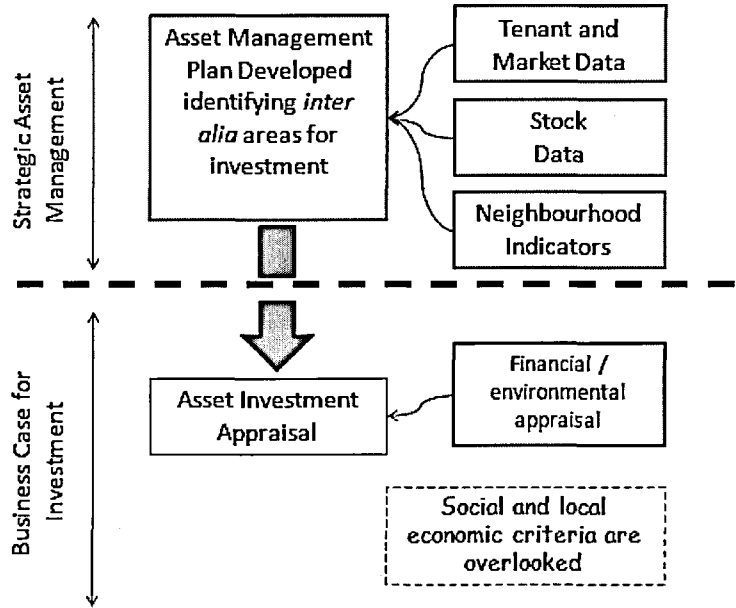
Figure 6.6: Mapping Existing Practice (Higham and Fortune, 2011)

In an attempt to help the organisation to transform its decision processes, the conceptual framework developed above is designed to integrate into the existing decision-analysis process, displayed in Figure 6.6. To improve this existing system, a new flow chart process, shown in Figure 6.8, has been devised. As with existing practice, the strategic asset management plan will be produced, identifying areas for intervention. However, when the business case for these interventions had been generated, the existing process was modified. The modification 'option evaluation', identified below, now integrates the group decision analysis process developed as a

result of this thesis. Designed to be independent of the existing financial analysis, for reasons explained below, sustainable benefit planning will also be undertaken, with both results presented in the business plan.

Yet, as with Bell's seminal framework, upon which this thesis builds, it is envisaged that, at some point, the outcome of the benefit analysis and the financial profile need to be integrated and an optimum balance achieved. In devising SMART, Edwards (1977) envisaged such a situation, referring to it as a special case, whereby one of the decision criteria is assigned a maximum limit, this could be for example the maximum available budget for the intervention works Edwards recommended that such attributes are best omitted from the initial decision model. An additional step would then calculate the ratio U_i/C_i where U_i is the aggregated utility score of the ith decision option and C_i is its estimated financial viability or capital cost. It could then be argued, with the business case, that the highest value of U_i/C_i would dictate the rational choice. Alternatively, if the board were relatively indifferent to the value of $C_{i,}$, provided that it fell within the budget limit of C^*, then the highest value of U_i could be chosen, provided that C_i is less then C^*.

To simplify this comparison process, the researcher proposes an alternative graphical representation of the data, whereby the results of the financial appraisal, in this case the outcome of the present value appraisal, are plotted against those of the sustainability assessment. To facilitate this data plot, the results of the SMART evaluation must be transformed into a simple index, by dividing the overall utility score into the benchmark score. The results of this process can then be graphically represented, as shown in Figure 6.7.

Sustainability Index Vs NPV
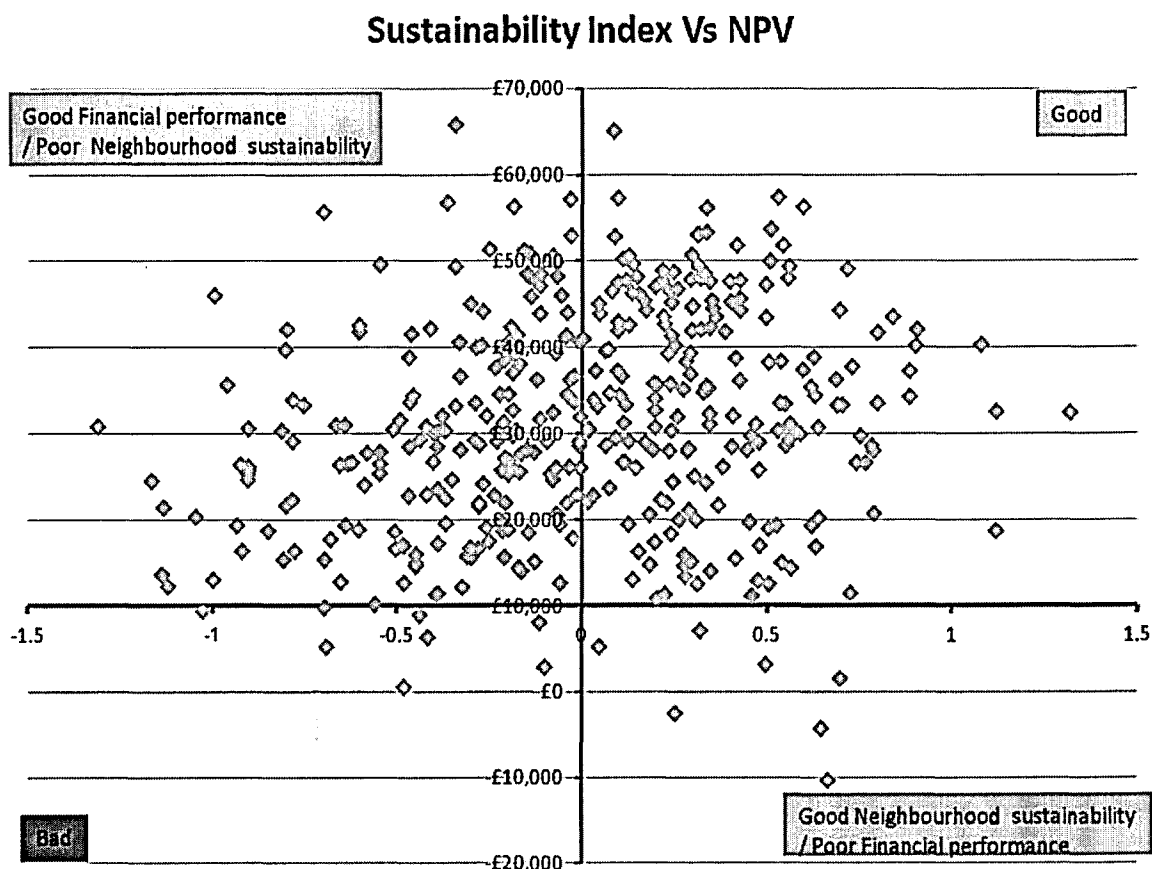
Figure 6.7: Plotting the decision data

Moving forwards within the flow chart, the researcher envisages that the initial appraisal of the options outlined above will be implemented by the organisation's senior staff, prior to presentation to the board. This will be undertaken at the *'option evaluation and decision'* stage; however, it was felt by the expert validation panel that a feedback loop would be needed at this stage to allow the process to be repeated with alternative options prior to the development of the business case for board approval, so this was subsequently added to the framework.

Once a decision has been made by the senior team, the project was further developed, to include a full strategic business case for investment which will be presented to the organisation's board for approval. A final feedback loop is included here, to allow for further iterations of the project to be developed if the board fails to approve the investment as proposed. In the event of approval, the proposal would

then move forwards to the project initiation stages identified in the RIBA plan of work (2013).
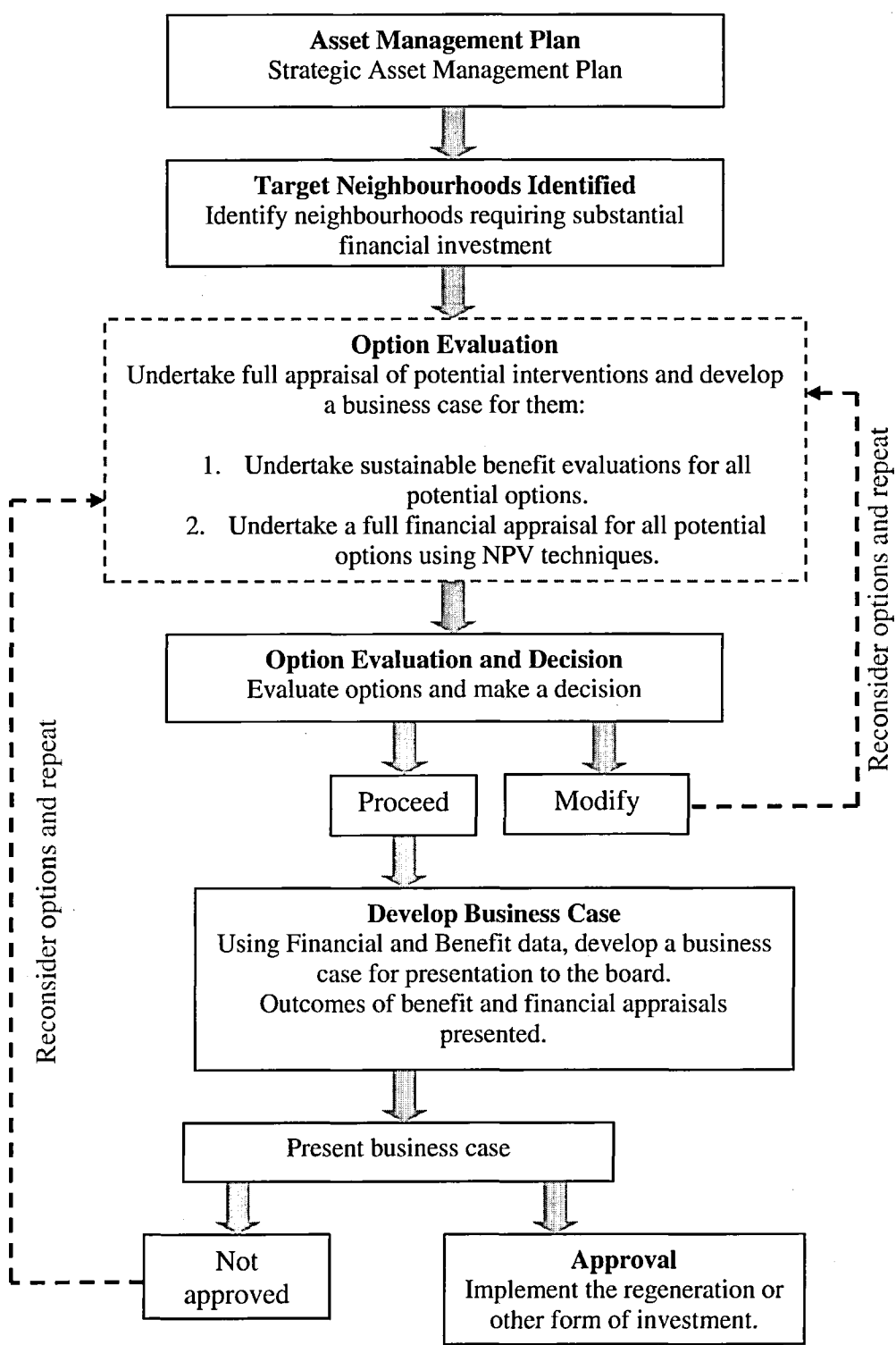
Figure 6.8: Modified Practice after conceptual framework inclusion.

6.10 Chapter Summary

The conceptual framework developed with a typical social housing provider operating in the Northwest of England has resulted in a set of 49 sustainable benefit indicators together with a methodology, developed from the SMART decision analysis framework proposed by Edwards (1977), which will allow social housing organisations to score and weight the identified features of sustainability.

The application of the conceptual framework is intended to allow social housing organisations to identify the optimum balance between expenditure on the one hand and value to the end user on the other. Value in this instance is taken to be the enhanced sustainable benefit for the communities resulting from the physical investment which is represented by a sustainability index. It is hoped that the technique will eventually allow social housing organisations to direct their investment in a manner which ensures value for money whilst also enhancing the sustainability of the housing stock and the communities residing in them.

Chapter 7   Validating the Conceptual framework

7.1 Introduction

Through the previous chapters based on primary data, the existing state of the art in terms of sustainable benefit planning has been mapped, suggesting that social housing organisations should continue to exhibit a strong focus on the financial appraisal of projects, although sustainability is clearly also becoming increasingly important. In an attempt to advance practice further, Chapters 5 and 6 report on the work undertaken with an enlightened social housing organisation. The research sought to expand the existing knowledge through the generation of a conceptual framework for sustainable benefit evaluation. This chapter explains the independent external evaluation of the conceptual framework developed. The focus of this final stage of the research is the appraisal of the views of senior social housing practitioners, who are deemed to hold sufficient knowledge and expertise to provide a critical evaluation of the framework's applicability, whilst also identifying further possible research directions or potential refinements to the framework to aid its implementation in practice.

7.2 Validation process and selection of experts.

The mapping of the state of the art in terms of current practice, the identification of the 49 *project centric* sustainability indicators and, finally, the development of the conceptual framework for the sustainable benefit evaluation of asset regeneration and improvement projects represent the main findings of this research and the three principle contributions to knowledge made by the PhD. To validate the relevancy of these findings and the processes used for their development, an independent sample of senior social housing practitioners, drawn from a range of independent social housing organisations, were consulted, to ensure that a balanced view of the variables and the overall framework developed is reported. Again to ensure that the

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participants are selected from an independent sample of professionals, discriminate sampling has been adopted using participants drawn from the latest edition of the National Housing Federation directory of members. To ensure complete independence from the earlier stages of the research, the selected participants were cross checked against the sample drawn for the exploratory interviews and large scale questionnaire reported in Chapter 4. Any matches between the two samples resulted in that person being discarded and another drawn until the sample was unique.

An initial sample of 11 senior professionals was developed, with the sample further discriminated using organisation size and type in an attempt to ensure that the sample selected mirrored the wider population. However, this would largely be dictated by the responses to the initial invitations. Each organisation was independently contacted initially by letter with a subsequent telephone call a fortnight after the initial invitation. This process resulted in a 55% response rate, with six directors agreeing to take part in the research. The final independent interviewee, drawn from the consultancy, was contacted thanks to a colleague who had worked with the participant during her time in practice. Table 7.1 below provides details of the final sample of participants.

Interview Reference	Title of Interviewee	Type and Size of Organisation
VAL01	Director of Housing Management	Large: HA
VAL02	Director of Housing Management	Large: HA
VAL03	Group Director of Housing	Large RSL
VAL04	Asset Manager	Small RSL
VAL05	Director of Development and Property Services	Medium HA
VAL06	Director of Asset Management	Small RSL
VAL07	Group Director	Consultancy.

Table 7.1: Validation Interview Sample Frame.

The interviews were conducted with minimal structure to allow the researcher to maximise the richness of the information gathered whilst also avoiding the pitfalls associated with interviewer bias advocated by Farrell (2011). The agenda for the

interviews was to cover the main contributions to knowledge reported in the thesis, including the mapping of the state of the art, the indicators for sustainability and, finally, the conceptual framework. An interview framework was prepared to guide the interview. This comprised only a short list of bullet points intended to guide the interviewer through the interview and ensure that the key themes were covered. This approach was sufficient to ensure the collection of comparable data, and the interviews allowed the interviewee to shift the focus as needed. The participants were invited to take part in an interview, held at their offices, with each interview lasting approximately 30 minutes. Finally, all of the interviews were tape recorded with the consent of each participant and transcribed verbatim.

7.3 Results from the Validation

The validation interviews sought to validate the results from the single organisation case study reported in Chapters 6 and 7. In undertaking the interviews, the researcher sought to explore if the framework could be applied outside the primary organisation, ensuring that the results are externally valid (Yin, 2014).

7.3.1 Relevance of Indicators

The first set of interview questions invited the experts to appraise the validity of the main features and various sub-nodes of sustainability identified in Chapter 5. The first stage in the process sought to evaluate whether the indicators identified captured the true complexity of sustainability as experienced in the social housing sector. Of the seven experts interviewed, five confirmed that the indicators comprehensively represented sustainability from the perspective of social housing:

> *"Very comprehensive list of indicators — I can see that [they] cover, certainly cover all the kinds of areas in a lot more depth than the sustainability indicator that we had, which was very crude, I think...". (VAL 03)*

"The features of sustainability identified within the framework are comprehensive; they cover everything we would wish to appraise".
(VAL07)

"It think it's good that the criteria – those are excellent housing qualities, design and layout, quality of the local environment, demand features, crime etc. – yes that is clearly a very comprehensive list, and the classification into six themes is also appropriate". (VAL05)

Expert VAL04 again felt that the list of variables was sufficiently comprehensive and captured the major issues facing the social housing sector. He especially noted:

"That instance of the car parking is a really good one because we always get asked about car parking". (VAL04)

However, two of the respondents did feel that the variables may not be completely representative of the sector. Expert VAL01 suggested that the earlier decision deliberately to exclude any dimensions of sustainability associated with health and, to an extent, wellbeing was a mistake, as this is likely to become a major consideration for future social housing projects:

"I think you do need to include some indicators relating to the health of the residents . . . I think that, for a lot of providers and local authorities, is going to be the major change moving forwards. . . Health is where we are going to get real benefit from investment so is there a way of building in any health indicators"? (VAL01)

Whilst expert VAL06 questioned the applicability of the indicators proposed to unique aspects of a sector which often consists of small organisations operating predominately in rural communities. In such communities, the expert suggested that the indicators of sustainability would be very different, with issues such as public transport being far more critical as a community service and therefore benefit:

"The indicators will be slightly different in that [rural] area because it is more about access to services and transportation, rather than crime and deprivation". (VAL06)

Once again, interviewee VAL6 raised the need to consider health as a key dimension of housing, arguing that *"a lot of the housing standards such as decent homes and fitness standards are rooted back to improving the health of residents".*

Finally, although the expert asserted that the range of features captured was representative, expert VAL05 suggested that a seventh dimension could be added to the framework, termed "impact on residents/community", which attempts to capture the impact of change on existing residents.

The second area of exploration sought to gather the experts' opinions in relation to potential difficulties in the application of the framework. Only interviewee VAL01 commented on the potential limitations, suggesting that, for some of the sub-nodes identified, gathering data and scoring against them could present difficulties:

"The only thing, some of these features might be dependent on local authority information as well which could be problematic".
(VAL01)

In terms of assessing the features of sustainability, it is clear that the experts consider the variables captured within the framework to be both comprehensive and relevant to social housing asset management. However, they did consider the omission of health and wellbeing to be significant. This omission would need to be re-evaluated in any future research before the framework is implemented in practice. During this review, the researcher should also consider adding the recommended seventh dimension of sustainability relating to 'tenant satisfaction', and possibly removing the feature 'governance'.

7.3.2 Validating the Framework

The experts were further invited to validate the conceptual framework for sustainable benefit planning of social housing projects. The validation of the framework again consisted of a series of questions focused on attempting to understand how the framework could be applied in practice. The majority of the experts felt, after reviewing the framework, that it would facilitate the sustainable benefit planning of potential investment projects.

> *"It looks good; it looks very, very thorough to say the least. . .No, it looks really good actually. I am quite impressed . . .I am certainly very interested in looking to use it". (VAL07)*

> *"Does it make a contribution . . . yes, I think there is a lack of a model within the sector and probably within the public sector as well as within the housing sector that actually really drives out the data and information that is strong, resolute in terms of community sustainability". (VAL04)*

Although interviewer, VAL01, did identify some potential areas for improvement, questioning how the framework would interconnect with the existing systems in terms of data feed in. A potential solution, he opined, would be to make the framework more strategic and align it with the LSP (Local Strategic Partnership) to allow it to transcend across to local social housing providers and local authorities or, alternatively, attempt to transform the framework into a piece of software, which will communicate directly with the existing IT systems within the organisation to allow the data to be drawn into the framework with relative ease. Although this is not to say that he did not think the framework was valid; indeed, he commented that such tools would be very useful for meeting the organisational commitment to Corporate Social Responsibility. Finally, towards the end of the interview, expert VAL01 did state:

> *"We did have a plan through our CSR (Corporate Social Responsibility) team to look at developing something that tracks*

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the health of our communities again. The only thing is, we did not think of using it to inform our investment decisions but now I have seen this, that was a failing as it clearly would help us meet our CSR targets and we could evidence that, if needed". (VAL01)

Expert VAL04 highlighted that, whilst their organisation had already attempted to develop a sustainability matrix for use within their own business, they felt that the framework proposed as a result of the research was:

"Highly useable – I think. Obviously, I know some of it is subjective, but I think it is quite good. Because, I think, one of the things that as an organisation like ourselves do struggle with, we always focus on the financial side. Putting customers at the heart of everything we do has been one of our straplines. It is again looking at the other side. Although we do it, we have not got anything like this. It is all based on assumptions or that type of thing". (VAL04)

Finally expert VAL03 suggested that the generalisability of the framework would be limited by the size of the potential user organisation, whilst he strongly agreed with the need for the framework, reaffirming the thesis offered in this research. He opining that it was extremely important that investment decisions are not solely based on financial option appraisals but also consider the wider sustainability of the local community. However, he did feel that the framework would be more applicable to smaller organisations, to which he felt such a tool would be invaluable. However, for larger organisations, that invariably have more expertise and have invested in complex GIS (Geographic Information Systems) systems, such a framework would not really be needed.

Yet, this view was to an extent countered by expert VAL06 who, despite seeing the benefit of the framework to practice, raised concerns about its suitability for very small organisations who may not own housing at an estate or community level, raising important questions about the framework's applicability to individual properties perhaps in rural communities, where this tool may be less applicable,

although he agreed that the basic framework could be adapted to suit such a property portfolio:

> "On the face of what you've shown me, straightaway it seems to sit very comfortably within an estate scenario, but I think that, with very little editing, you could change it to a more rural aspect so it might be 'availability of transport' as a tab which might become important". (VAL06)

A sequence of further questions probed the experts' opinions of the framework, with questions focused on both the subjectivity of the SMART technique and also the array of features examined. In terms of the latter, the majority of the respondents' did not consider the inclusion of 49 nodes of sustainability problems, although expert VAL03 did suggest that, in practice, it may become a problem, which can only be confirmed once the framework has been implemented:

> "It looks great. . . it covers. . ..Excellent. No, it looks really good. I think, yes. It is just the point of awareness, it is maybe broad. . . as you say, it is looking at it broadly, I get you could use it within your own stock in your area was well". (VAL03)

Turning attention to the subjectivity of the framework, the majority of the respondents considered neither the adoption of a group decision approach to present a particular problem nor the subjectivity of some of the nodes of sustainability a major barrier to its implementation. Indeed, expert VAL06 suggested even the traditional condition survey can be highly subjective:

> "Even condition surveys are subjective . . . they are based on 10% of the stock. They are then undertaken by a surveyor who is only human so can miss things. Maybe they have been influenced by the tenant who wants certain things or maybe they just can't be bothered repairing things and just suggest we replace everything, So this is not much different, is it, from that point of view"? (VAL06)

Yet, expert VAL02, drawn from one of the UK's largest social housing organisations, did opine that the framework was overly subjective in its approach. Instead, they suggested that the framework should be aligned with the GIS system, thereby allowing the former to draw on objective data from within the organisation. In addition, they suggested further refinements to the tool to allow neighbourhood to neighbourhood comparisons:

> *"The thing that strikes me is you can't compare neighbourhoods.*
> *The benefit of this is that you can look at different scenarios for a*
> *neighbourhood, which is good because we don't do that; it is very*
> *much looking backwards and evidence-driven. This is good*
> *because you can come up with different ideas and different*
> *scenarios, but you can't compare neighbourhoods which have got*
> *to be there if you're looking at investment, I would think". (VAL02)*

Although this would arguably be conducted during the development of the strategic asset management plan, such refinements to the framework would, without doubt, extend its relevance to practice and have subsequently been accommodated. Finally, expert VAL02 suggested further amendments to the framework which would allow the benchmarking of options to be widened to benchmark neighbourhoods against national trends. Whilst the review by expert VAL02 suggests that they had not grasped the project focus of the framework, instead looking at it from the prospective of a neighbourhood modelling tool, it is nonetheless useful feedback for future iterations of the conceptual framework, potentially making it possible to explore a more strategic application.

Finally, to validate the framework, the researcher sought the opinions of the seven experts on how it could assist with the other fundamental objective of its creation, which was to communicate and justify potential project strategies. As such, the experts were asked whether they thought that the tool would assist in the development of the business case. In responding to this question, the experts achieved near consensus in their view that it would enhance the communication of

ideas to, *inter alia*, board members and resident groups. For instance, expert VAL04 commented that:

> *"Everything is about having something to convince the board that it is a good thing to do. So I think, for that purpose, it [the framework] would be really good because, at the end of the day, they are the ones, we know, but its convincing the board that it is the right decision. . . based on all these factors and not just the financials". (VAL04)*

Before eluding further to the benefits of the framework in assisting built environment professionals to bring regeneration projects forwards, where the focus would undoubtedly be on problematic estates:

> *"I'm thinking about the possibility of using this framework when looking at regenerations. The first thing we look at is obviously the financials of the estate. What is the potential investment? Yet, if we can start of think about re-let times, voids, the demand and all those things, anti-social behaviour, that type of thing, that would be great. I think we do already but not in this much detail. We never really look at things like impact - if we do something on the estate what impact might it have on say anti-social behaviour or even reputation? – really". (VAL04)*

Yet, in terms of applicability, Expert VAL04 opined that the framework may be too comprehensive for small projects; for instance, where the organisation has only one or two units within a neighbourhood, although he did qualify his critique by asserting that, for major regeneration projects, the tool would be invaluable. Expert VAL05 identified other benefits that the use of the framework may present, whilst he postulated that, as a professional:

> *"Instinctively, what you do. . . is to assess things in a very subjective way: the environment, the feedback from the local authority, what the quality of the relationship is like with that local*

authority, your feedback from other stakeholders – whether it is
health, regeneration - and you then balance that, and I have to say,
yes, we should invest". (VAL05)

The pitfalls of this approach, he suggested, would be that, as a professional, it is acceptable to reach such decisions, but how do you communicate, validate and justify your subjective opinion? He commended the framework on its *"simplicity of communication"*, attesting that:

> *"Sometimes, a simple diagram with colour coding, as captured on*
> *the model's summary sheet, can communicate the justification for a*
> *course of action to a board or to a group of residents. People will*
> *in one sense see a spreadsheet and go, 'Ah, horrible!' Yet, show*
> *the same information in a simple colour coded table on the wall,*
> *and they'll say, 'Ah, yes I understand that', and take it in".*
> *(VAL05)*

Having such a tool, he reaffirms, will ease these difficulties somewhat, whilst also making tenant consultation simpler, as the person having to relay potentially disappointing news will be able to provide a clear justification and rationale for how that decision was reached.

The final questions sought to gauge the framework's likely contribution to industry, from the perspective of advancing the practice of built environment professionals working in the social housing sector. Initially, expert VAL01 re-confirmed the existence of the gaps in practice identified through both the review of the literature and the mapping of the state of the art reported in Chapter Four:

> *"I think there is a definite niche in the market in terms of*
> *neighbourhood sustainability that there is a lack of that that this*
> *could certainly meet". (VAL01)*

Returning to the original purpose of the questions, expert VAL04 clearly felt that the framework had indeed made a significant contribution to practice, asking:

"Can I keep a copy? I am quite interested, obviously. When I looked at the framework I straight away thought, 'Well, we have all of this information available, but again we aren't really pulling it together when we are looking at financial approvals. Some of this information does not even go in there. I am thinking, 'Well, I've never really thought of using it for that!''". (VAL04)

The other contribution that the framework could make within the experts' organisation was the potential to re-focus the framework from its original *ex-anti* viewpoint into an *ex-post* tool for the evaluation and monitoring of progress in a similar way to that proposed in the work of Dixon (2012) undertaken with Berkley Homes:

"We used to record customer satisfaction because we used to have to. Now we don't have to, how do we know that the money we are spending - £16 million every year - is improving the lives of our residents or the estates they live on? At the moment, I don't think we can demonstrate that". (VAL04)

Expert VAL06 supported the growing consensus suggesting that the framework makes an important contribution to practice by highlighting that, whilst individual property decisions could be made on the basis of a financial appraisal alone, when looking at major schemes, for example estate regeneration projects, it is clear that a wider range of factors make a significant contribution:

"In terms of investment, is it actually in terms of an individual property or are you just basing that on its physical condition (which is subjective anyway – surveyors' judgements) so, for example, whether it lasts long enough to stand the investment? Whereas in an estate environment, you're probably more influenced by the social factors that surround it than the property itself". (VAL06)

However, three of the experts suggested that the main weakness of the framework relates to its title: a *sustainable benefit evaluation framework*. Experts VAL04, VAL06 and VAL07 suggested the removal of the word *sustainable*. In justifying this argument, the experts suggested that the word 'sustainability' is becoming over used and, in the view of expert VAL07, getting *"bandied about too much"*. In making this point, expert VAL04 quite candidly asserted:

> *"It is almost like I am at the point where I'm rolling my eyes and thinking, personally, this is sustainability, because it means so many things . . .so I'm trying to move away from it . . . but I think your talk about benefit is better than . . .a benefit assessment almost. . .call it that!" (VAL04)*

7.4 Chapter Summary

The validation process reported has been conducted to confirm both the validity of the conceptual framework developed and its applicability outside the primary case study organisation. Interviews were conducted with seven social housing experts drawn from across the North of England, with the primary objective of examining and critically evaluating the framework proposed. Six social housing organisation directors with responsibility for asset management together with the Group Director of a major consultancy practice were selected based on their seniority and expert knowledge developed as a result of their experience of working in social housing.

The results from the interviews exhibit a very high degree of consensus amongst the seven experts, further evidencing the validity of the research, with the interviewees agreeing that the conceptual framework for sustainable benefit evaluation in the social housing sector was relatively simple to apply, yet clear and auditable within the processes used. It was further asserted that the variables identified do, in the main, map the essential considerations for social housing organisations, although two respondents did allude to a further array of indicators which should be included within the framework.

The final evidence of validity came from two experts who, during the course of the interview, requested copies of the framework, whilst a third national social housing organisation, not consulted as part of this research, made an unsolicited approach to discuss the possible further development of the conceptual framework within their own organisation through the application of an action research study. At the time of writing, this research had been commissioned, with the work commencing in April 2014 and the outcomes due to be reported in November 2014.

Chapter 8 Conclusions and Recommendations

8.1 Introduction

The research has combined a set of methodological approaches to address the central research problem relating to the sustainable benefit evaluation of social housing projects. The outcomes of each phase of the research have been designed to fit within the overall SSM framework. This chapter presents the conclusions reached from this work. The chapter is structured to present the main findings and show how the objectives of the research have been addressed. The relevance of the work for academic and practical purposes is then discussed with respect to the generation of new knowledge. Finally, consideration is given to the potential avenues of further work as a result of this research.

8.2 Main Findings

The comprehensive literature review evaluated two principle areas of literature, the first relating to sustainability through the lens of sustainable development and sustainable communities and the second to asset management within the social housing sector. These confirmed the initial focus of the research, validating the research aim and the identified objectives. The literature review identified two principle filters for the interpretation and application of sustainability. The first was related to the interpretation of sustainable development policy by built environment professionals working in the social housing sector, whilst the second considered how sustainable development policy can be translated into the evaluation of potential projects. The argument developed within this thesis sought to explore how the social housing sector interprets and understands sustainability and, more specifically, how this understanding influences the asset management decision evaluation process, with a view to refining existing practice to reduce the gap identified between theory

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and practice. To develop these arguments, the research set out to address five questions:

(1) What are the key features of sustainability relevant to the social housing sector?

(2) How can sustainability be defined within social housing asset management?

(3) How are major asset management projects, including regeneration and large scale estate transformation, currently evaluated?

(4) Is sustainability adequately represented in the existing project evaluation processes?

(5) Would the development of a framework for the sustainable benefit evaluation of such projects reduce the gap between theory and practice?

Questions 1 and 2 were concerned with the interpretation of sustainability in both the social housing sector and, more specifically, in the management of the existing social housing stock. Question 3 appraised the existing project evaluation tools that are in use throughout the sector. Question 4 considered the extent to which sustainability was evaluated by the tools identified as an outcome of question 3, whilst question 5 sought to appraise whether the modifications to practice alluded to in the work of Bell (1981), Li and Shen (2002), Treanor and Walker (2004), Carter (2005), Yates (2006) and, finally, Fortune (2007) could reduce the gap between theory and practice identified by Higham and Fortune (2010) and reaffirmed in this thesis.

The most significant outcome of this research was the development of the conceptual framework for the evaluation of potential sustainable benefits associated with investment projects. This framework comprises of 49 phenomena grouped into six core features of sustainability, together with their associated utility weightings. The framework is designed to facilitate group scoring and evaluation based on the maximisation of the utility benefit associated with various options. Prior to the identification of the optimum solution based on the decision makers' appraisal of the balance between sustainable benefit (as indicated by the aggregated utility score) and the available budget or other indicator of economic merit, the framework considerably expands the methodology outlined in Bell's (1981) earlier work through

the provision of clear benefit criteria and a comprehensive evaluation methodology. Additionally, the work refines and advances the National Housing Federation's best practice guidance produced by Treanor and Walker (2004), which failed to clarify the sustainability factors relevant to decision making. Finally, the conceptual framework moves away from the dominant environmental focus exhibited in Yates' (2006) work with the BRE Trust. The development of the conceptual framework reduces the identified gap between theory and practice, facilitating the consideration of sustainable benefit within the feasibility evaluation process, whilst also eliminating a number of the limitations exhibited in the decision support tools identified in the literature review.

The second significant finding of the research related to the comprehensive mapping of sustainability phenomena that were deemed to influence social housing asset management projects. This mapping identified 49 sustainability phenomena grouped under six principle features of sustainability which are seen to be relevant to social housing asset management decisions. The identification of these phenomena provides an in depth understanding of sustainable development in relation to asset management not previously published in the literature. This finding confirms that a gap exists between policy and practice in the delivery of sustainable development, with the features of sustainability identified in Chapter 5 exhibiting a strong bias towards the socio-economic aspects of sustainability, revealing a departure from the policy interpretation of sustainable development which promotes the equal balance of social, economic and environmental sustainability whilst also dismissing the strong environmental focus often exhibited in research associated with transitioning practice towards the creation of a sustainable built environment.

The final contribution of this research is a comprehensive mapping of the state of the art in terms of sustainable asset management practice within the social housing sector. The mapping reaffirms the findings of Cooper and Jones' (2008) survey of maintenance managers and Carter and Fortune's (2007) survey of development managers, in terms of the sector's commitment to sustainability, with less than 50% of organisations having a sustainable development policy in place. Since the earlier surveys had been undertaken, the HCA removed the requirement for social housing

organisations to develop such policies, resulting in the stagnation noted. Further, the mapping of the state of the art confirmed the existence of a gap between policy and practice in the delivery of sustainable development. The identification of sustainable phenomena in chapter 5 suggests a potential departure from the policy interpretation of sustainable development. This was confirmed by the large scale survey, which showed that this was ingrained in the sector.

In addition, the survey revealed that the existence of a corporate policy on sustainable development did have an influence on practitioners' consideration (or lack thereof) of sustainable issues at the initial project appraisal stage. Furthermore, the work identified the more significant of the over-arching features of sustainability that the practitioners perceived needed to be evaluated when making sustainability-led investment appraisal decisions for social housing refurbishment projects in the UK. The results indicated that the practitioners are still concentrating on providing low energy buildings as a principal way to deliver sustainable housing projects. Yet, the work identified that the practitioners considered other, more social and economic factors when making sustainability-led investment appraisal decisions for social housing refurbishment projects.

8.2.1 Review of the objectives

The aim and objectives of this research were identified in Chapter 1. The following section explains what has been done to address these specific objectives within the thesis.

Objective 1: Evaluate the current state of the art relating to the theory of housing investment appraisal together with the perceived importance of sustainability.

Although it was already known that the built environment had a large part to play in the delivery of sustainable development, no established theory on how this should be achieved had emerged from the literature. The literature review explored the international development of the concept of sustainability, documenting how the

early concerns for the global environment evolved into the international acceptance of the World Commission on Environment and Development's holistic definition of sustainability, incorporating social, economic and environmental perspectives. Finally, project-level sustainable evaluation frameworks, which assist professionals to embed sustainability into projects, were reviewed. The review of the literature proceeded to evaluate asset management in the context of social housing. Specifically, the review of the literature evaluated the different schools of thought relating to strategic asset management before appraising potential project tools. The outcome of the literature review was the identification of a number of sustainability and asset management tools which would facilitate the evaluation of sustainable benefits at project level.

To complete the mapping of the state of the art, an initial round of exploratory interviews was conducted, followed by a confirmatory large scale survey of the practice implemented. The results of the exploratory interviews, taken together with the survey, revealed that practitioners are concentrating on providing low energy buildings as a principal way of delivering sustainable housing projects. In addition, the work identified that practitioners also considered other more social and economic factors when making sustainability-led investment appraisal decisions for social housing refurbishment projects. Yet, a comparison of these findings against earlier surveys of built environment practitioners, including those undertaken by Adeyeye *et al* (2005), Dixon (2007), Pitt *et al* (2009), Presley and Meade (2010) and Higham (2011), which concluded that built environment professionals generally exhibited either a narrow understanding of sustainability focused pre-dominantly on energy usage or, in some instances, that sustainability was irrelevant to their profession. Suggesting professionals in the social housing sector exhibit a more robust understanding of sustainability.

Yet, the survey has shown that practitioners working in the UK social housing sector continue to favour the use of economic appraisal frameworks for the evaluation of housing refurbishment projects. In general, this finding is irrespective of particular organisational characteristics related to size, geographical location, de-nomination and maturity. This ranking of frameworks supports the findings of previous work by

Fortune and Cox (2005), which add weight to Brandon and Lombardi's (2011:25) observation that most of the sustainability led toolkits available are "either incomplete or totally unstructured". In either case, they asserted that their application was impossible in practice.

Objective 2: Identify and appraise the extent to which the dimensions of sustainability, namely the social, economic, and environmental dimensions, influence the asset management decision.

Well over 400 potential features of sustainability for the social housing sector emerged from the literature. Whilst it was impractical to evaluate all features, it was resolved to test the principle features of sustainability identified from the literature. The resultant rankings identified that factors including energy efficiency, asset life expectancy, the condition survey and general demand levels were seen as the most important, whereas the more subjective phenomenon associated with sustainability, including the quality of existing housing, design aesthetics and the quality of the local environment together with various social attributes, including crime, anti-social behaviour, community mix, community cohesion, and access to local facilities, were ranked as less important. Whilst the findings allude to the fact that socio-economic issues are likely to be important to the project evaluation and decision making process, they are nonetheless deemed to be less significant than the traditional project success factors, such as cost, financial return, asset condition and other general economic or physical criteria when the viability of projects is appraised. Additionally, the result of the survey provided further evidence to suggest that built environmental practitioners should remain focused on the provision of low energy buildings as the principle way of combating climate change and delivering sustainable development objectives, reaffirming the findings of earlier surveys of practice (Hall and Purchase, 2006; Fortune and Essa, 2008) suggesting that the social housing sector's engagement with sustainability is, at best, focused towards the delivery of environmental sustainability, with low levels of achievement at the project level. As a result, it can be concluded that, despite those professionals

working in the social housing sector exhibiting a stronger understanding of sustainability than other built environment professionals, they are yet to fully embed this knowledge into practice when evaluating asset investment schemes.

Objective 3: Gain an understanding of the features of sustainability relevant to the benefit planning of social housing asset management.

The first stage of the case study research undertaken with a typical registered social landlord was used to establish the principle features of sustainability relevant to both social housing in general, but also to the evaluation of potential asset investment schemes. The initial analysis of ten seminal contributions to the literature resulted in a theoretical framework from which six principle features of sustainability, together with an underlying 163 nodes, emerged. Using a series of semi-structured interviews with senior professionals drawn from across the organisation, this initial framework was refined to present a *project centric* view of sustainability consisting of 49 separate nodes of sustainability, again grouped into six principle areas, including *Built Environment, Local Environment, Market Dynamics, Local Economy, Society,* and *Governance.*

Objective 4: Develop a sustainable benefit evaluation tool for use as a decision aid during the business case appraisal for proposed stock investment.

The earlier phases of the study identified a significant gap between the view of sustainability advocated by various government agencies including the Homes and Communities Agency and the understanding of sustainability displayed at the project level. This gap presents a difficulty for the housing agencies in assessing projects being put forward for funding, and for the practitioners attempting to gain funding. Additional problems emerge where the project is the focus of internal funding, with the commercial appraisal of the project often taking priority, as the decision maker is unable adequately to visualise the subjective and often unsupported advice provided by experts. Despite various attempts to overcome these difficulties reported in the

literature, there remains a need for a framework which bridges these gaps, by defining what sustainability means for a project whilst also providing some form of methodology for its appraisal, which allows the professional judgement of the expert to be exhibited in a clear and understandable way.

The conceptual sustainable benefit evaluation framework was developed to fill this gap in practice, based on the SMART methodology for decision analysis. The framework allows social housing organisations to score and weight the subjective elements of sustainability when these scores are translated into a sustainability index and plotted against the results from the financial appraisal. The optimum balance between expenditure and value to the user can be established. It is hoped that this technique will eventually allow social housing organisations to direct their investment in a manner which ensures both value for money whilst also enhancing the sustainability of the housing stock and the communities residing in them. Unlike some `black box' frameworks (Chen et al. 2005; Ding 2005; Essa, 2008), the output of this framework is transparent and encourages the continued use of the framework throughout the project evaluation process.

8.3 Academic Relevance

To develop a conceptual framework to assist social housing providers to assess the most suitable intervention technique for asset investment, it was first necessary to map the state of the art in terms of sustainable project appraisal. Although this had been mapped out in the social housing sector in terms of new development projects (Carter and Fortune, 2006; Essa and Fortune, 2008) and maintenance management (Cooper and Jones, 2009), this collective body of evidence failed fully to appraise the extent to which sustainability informed housing associations' approaches to project-level option appraisals when considering investment in the existing portfolio.

Previous work examining asset management in the social housing sector has largely opted for a policy or strategic orientated approach. Studies such as those by Brown *et al* (2002), Gruis *et al* (2003; 2004), Gruis (2008), Gibb and Treback (2009), Morriso

(2013), and Nieboer and Gruis (2014) draw attention to the different approaches adopted by housing associations in England and the Netherlands, yet the authors fail to present an in-depth empirical analysis to support their assertions, whilst further work by Gruis (2002; 2005) and Gruis and Nieboer (2004) is concentrated on the limited use of economic and quantitative analyses to measure social and financial performance in asset management. In an attempt to apply focus, Albanese (2007) used her doctoral work to generate case study based empirical evidence of specific decision-making processes utilised by housing associations when developing an asset management strategy. In justifying her employment of case studies, Albanese (2007) evidenced the use of disparate approaches to asset evaluation throughout the social housing sector discovered during her initial exploratory research. Further analysis identified a desire amongst organisations to implement decision-making processes that were reflective of the interplay between geographical and commercial phenomena specific to their organisation and locality. In contrast, this study was concerned with the development of a decision framework, which would aid project level sustainable asset management decisions, allowing the decision makers to evaluate the interplay between the key social, economic and environmental phenomena. As a result, the research extended our current knowledge of sustainable practice within the social housing sector by developing our understanding of the role that it can play in the management of existing assets, whilst also extending the earlier work of Bell (1981), Treanor and Walker (2004) and Yates (2006) in terms of developing a suitable decision analysis tool to aid practitioners in their evaluation of stainable asset management decisions, thus widening the focus from the sole appraisal of a scheme's economic merit to one which also considers the wider interplay between the key social, economic and environmental phenomena and so allowing the decision makers fully to appraise the benefit offered by specific investment.

Two journal papers and further conference papers on the issues arising from the research are being prepared to disseminate the findings to a wider audience of practitioners and fellow academics. It is hoped to publish in leading journals to ensure the widest circulation of the main findings. With this in mind, the first of

these papers, outlining the findings resulting from the mapping of the state of the art, has been submitted to the *Journal of Engineering, Construction and Architectural Management* for review. It is further anticipated that a second paper, communicating the conceptual framework resulting from this research, will be submitted to *Construction Management and Economics* in late July 2014. In addition, a further conference paper outlining the features of sustainability relevant to the social housing sector has been submitted for review to the ARCOM conference to be held in Portsmouth in September 2014.

During the course of the research, three academic papers were published at leading conferences. The initial paper (Higham and Fortune, 2010) contributed to the discussion on professionals' understanding of sustainability, with a specific focus on those delivering regeneration activities on behalf of local authorities using the HMR funding model. Subsequent papers further presented aspects of the research, including the findings of the initial exploratory interviews (Higham and Fortune, 2011) and the initial observations from the large scale survey of practice (Higham and Fortune, 2012). Presenting the research at conferences provided an opportunity to gain useful feedback from colleagues and reflect on the relevance of the research to the development of theory in the subject area.

The methodological approach used in this thesis has made use of a number of approaches that are often used in isolation of one another. The integration of these methodologies challenges the argument against using a mixed methodology. The methodologies have been used in a novel way to address the multi-faceted research problem. The integrated approach serves to tackle both the subjective and objective aspects of incorporating sustainability into the financially driven project appraisal system.

To conclude, the main findings of this work significantly extend earlier work undertaken in the field of holistic sustainable asset evaluation, including the seminal work of Bell (1981), which first proposed the concept of sustainable project appraisal and which, together with the later work of Treanor and Walker (2004), was published as best practice guidance by the National Housing Federation. Through the provision

of both a clear, systematic and auditable evaluation methodology, whilst also reducing and refining the array of sustainability indicators identified by Treanor and Walker (2004), the work also bridged the gap between the 'black box', mathematically complex sustainability evaluation frameworks proposed by both Li and Shen (2002) and Ding (2005) and the highly subjective alternative approach proposed by Carter (2005), in the hope of overcoming the assertion made in the seminal work of Brandon and Lombardi (2011:25) that the overly complex, incomplete or totally unstructured nature of many existing frameworks made their application impossible. Furthermore, the work adds to our collective understanding of sustainability within the social housing sector, thus advancing the earlier mappings of practice developed by Carter and Fortune (2006), Essa and Fortune (2008), and Cooper and Jones (2008, 2009).

8.4 Relevance to Practice

The research has potential for improving the way in which social housing practitioners address the issue of sustainability during the evaluation of potential regeneration or other housing investment schemes. Offering practitioners a structured approach for the appraisal of sustainable benefit resulting from potential schemes is becoming an essential part of the strategic business case that the boards of housing associations require if senior professionals are adequately to make the case for less financially beneficial investment on the grounds of enhanced benefits to the local community, or potential long terms benefits to the organisation. The conceptual framework proposed provides this structured approach and presents a tool to aid decision making, whilst also allowing the organisation to move towards meeting the additional value objectives of the housing agency funding body, who are increasingly seeking to evaluate how the schemes put forward by bidders enhance the wider community. More importantly, it stands to integrate sustainability more effectively into social housing regeneration and asset investment projects. As an important sector within the construction industry, this has a role to play in helping the industry as a whole become more sustainable.

Each phase of this research has been firmly grounded in practice. The expert opinions expressed during the exploratory interviews helped the researcher to focus the study, whilst these initial views were once again tested through the survey undertaken in the real world. The later phases of the research were again executed with the support of practice. Through the use of a case study methodology, the research strongly focused on improving the existing processes within a typical social housing organisation. The final conceptual framework was again subjected to independent external expert scrutiny through the seven validating interviews, again drawing on a sample of senior industry practitioners.

The conceptual framework has been designed and tested for use in practice as a product of the earlier phases of the research. The social housing sector is inundated with practical guidance and policy rhetoric on what sustainability means. The toolkits available to the social housing sector (Talbot 2001; Long and Hutchins 2003; Trainer and Walker, 2004; Turcu, 2010, 2013) provide comprehensive but overwhelming lists of attributes that housing associations are recommended to incorporate into their projects. This research revealed a need for project specific assistance on integrating sustainability in a meaningful way. The research addresses this need through the development of a tool designed to provide a set of features that are applicable in practice.

As a result of both the earlier publications and engagement with practice, the researcher is currently developing an action research study in conjunction with another social housing provider. The research is seeking to evaluate how the conceptual framework can be used in practice to inform investment decisions, providing the researcher with the opportunity to continue his research, whilst also further confirming the validity and currency of the research and, more importantly, the significant contribution it may make in practice.

8.5 Scope for Further Work

The research has created many potential avenues for further work to benefit both the development of academic and practice based knowledge and expertise. There is great potential for knowledge transfer of the findings to practitioners and the wider academic community. However, the researcher recommends the making of further refinements to the framework prior to implementation.

The validation process, undertaken through interviews with senior industry professionals, identified several avenues for further refinement of the initial 49 nodes, clustered around six principle features of sustainability. It was opined that 'health and wellbeing' and 'impact on the community' should be added. It is therefore resolved that any future application of the conceptual framework should initially explore the potential inclusion of these variables. In addition, as outlined in the statement of limitations in chapter 1, the main case study organisation that supported the development of the conceptual framework restricted its focus to internal stakeholders only. A potential benefit of further refining the framework would be the opportunity further to explore the external stakeholders' (tenants') views of sustainability to ensure that the variables presented within the framework are adequate.

The conceptual framework, at present, is in a relatively simple format, and is provided as a stand-alone tool, although the use of decision analysis as an underlying methodology for the framework would allow for the expansion of the process. It is hoped that the initial conceptual framework can be further refined and embedded into the SMART value management process developed by Green (1992; 1996) in his seminal work, with a view to developing a framework which will facilitate the use of SMART value management for social housing asset management projects, which will extend the scope of the initial framework. This research would additionally expand the application of value management into the later stages of the project life cycle.

Word Count

Excluding 10,263 words of ancillary data (allowable under the regulations), references and appendices, the total word count for the PhD thesis is 79,893 words.

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Appendix 1–University of Salford (Ethical Approval).

Academic Audit and Governance Committee

Research Ethics Panel
(REP)

To	Anthony Paul Higham
cc:	Prof C Fortune, Prof M Kagioglou
From	Jayne Hunter, Contracts Administrator
Date	23rd June 2011

MEMORANDUM

<u>Subject:</u>	Approval of your Project by REP
<u>Project Title:</u>	Sustainable Asset Management (SAM) decision framework for social housing.
<u>REP Reference:</u>	REP11/089

Following your responses to the Panel's queries, based on the information you provided, I can confirm that they have no objections on ethical grounds to your project.

If there are any changes to the project and/or its methodology, please inform the Panel as soon as possible.

Regards,

Jayne Hunter
Contracts Administrator

Appendix 2–National Questionnaire Instrument.

Dear Sir or Madam.

Re: Sustainable Property Asset Management Practices in the Social Housing Sector.

I am conducting research, supported by my present employer, the University of Bolton towards the achievement of my PhD under the Supervision of Professor Chris Fortune at the University of Salford.

In its entirety, the research aims to develop a strategic decision framework for use in the development of the business case for asset management investment at either the programme or individual project level.

To achieve this aim, I am now seeking to undertake a large-scale survey of social housing providers to allow the current "state of the art" in sustainable asset management to be mapped.

Thank you for taking the time to complete this survey. All information received will be treated with the utmost confidentiality. If you want to contact me or require any further information please use the following contact details. A short summary of the results will be made available to all those that indicate an interest.

If you are unable to complete the survey, please feel free to pass it on to a colleague responsible for asset management decisions in your organisation.

Yours Faithfully

Anthony Higham

Sustainable Asset Management Practices in the Social Housing Sector

Please tick the most appropriate answer unless told otherwise.

Section A – Your Organisation

1. Which of the following statements would best classify your organisation?

   Registered Social Landlord ☐   ALMO ☐

   Housing Association ☐   Local Authority ☐

   Other: _

2. Has your organisation been formed as a result of housing stock transfer?
   Yes/No

3. When was your organisation founded? _

4. Does your organisation operate:

   Within its immediate locality ☐   Regionally ☐

   Nationally ☐

5. What number of dwellings do you currently have in your property portfolio?

   Less than 1000 ☐   1,001 – 5000 ☐

   5,001 – 10,000 ☐   Over 10,000 ☐

6. What percentage of your stock is in low demand areas?

   0 – 19% ☐   20 – 39% ☐

   40 – 59% ☐   60 – 79% ☐

   80 – 100% ☐

Section B – Stock Investment

7. How many units are / were / will be developed or refurbished by your organisation between April and March of:

	Refurbished	New build
Last Financial Year		
Current Financial Year		
Next Financial Year (Projected)		

> In the above question, Refurbishment is taken to be major redevelopment works not regular maintenance or decent homes work.

8. How is the overall property investment distributed in the last financial year (April 2010 – March 2011)?

Form of Investment	Approx %	Form of Investment	Approx %
Responsive maintenance		Refurbishment (external improvements)	
Planned preventative maintenance (re-roofing, windows, doors and the like)		Major refurbishment / remodelling	
Decent homes work		Demolition	
Energy Efficiency Work (Green Deal work)		New Construction	

9. What are your organisation's strategic objectives for your portfolio over the next five years (*tick all that apply*).

Form of Investment		Form of Investment	
Responsive maintenance		Refurbishment (external improvements)	
Planned preventative maintenance (re-roofing, windows, doors and the like)		Major refurbishment / remodelling	

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Decent homes work		Demolition	
Energy Efficiency Work (Green Deal work)		New Construction	

10. Thinking about how your organisation set its investment objectives, have any of the following resources or methods been used to help inform the decisions made? (*Tick all that apply*).

Methods / Techniques		Methods / Techniques	
Estate viability assessment		Housing Corporation / Homes and Communities Agency Guidance	
Market Intelligence data		Other good practice guidance	
Other sources of data			

11. If you selected "*estate viability assessment*" in question eleven above, which methodology does your organisation use?

	Always	Occasionally	Hardly ever	Never used
Capital Cost				
Life Cycle Cost analysis				
Whole Life cost analysis				
Discounted Cash Flow using Net Present Value				
Discounted Cash Flow using Internal Rate of Return.				
Social Return on Investment				
Cost Benefit Analysis				
Social Capital Studies				
P.R.I.S.M.				
Social Impact Assessment				
EcoHomes XB				
National Housing Federation Framework				
Own In-House system (Please provide brief				

details below)				
Other proprietary system (please give details below)				
Other (*please specify below*)				

Section D – Sustainability strategy

12. Does your organisation have a sustainable development policy?

Yes/No/Being Developed

13. To what extent does your policy focus on the following dimensions of sustainability (please apply an approximate percentage).

Social _____ Environmental _____ Economic _____

14. How has / How would the introduction of the sustainable development policy impacts/ impacted on portfolio investment decisions?
    1 being low importance and five being highly important (Please circle)

1 2 3 4 5

15. Which of the following do you believe should inform **sustainable** stock investment decisions? (Please indicate an importance ranking 0 = not relevant 1 = of little relevance and 5 = highly relevant)

Physical Condition Criteria	Importance
Housing Quality Indicators	
Stock Condition	
Decent Homes	
Design Aesthetics	
Other(*please specify*)	

Environmental Criteria	Importance
Energy Performance	
Quality of Environment	
Other(*please specify*)	

Social Criteria	Importance
Reputation	
Crime and Anti-social Behaviour	
Social Exclusion	
Accessibility to facilities, services and employment	
Community Cohesion	
Community Mix	
Other(*please specify*)	

Economic Criteria	Importance
Current Demand	
Long Term Demand	
Maintenance Costs	
Building Life Expectancy	
Other(*please specify*)	

Section F – Conclusion

If you are willing to take part in the next phase of the research, which will involve a short interview, or alternatively wish to receive a summary of the findings. Please provide your contact details below.

❖ I would like to receive a short summary of the results of study Yes / No

Name:

Address ....

....

....

Telephone
Number ....
E-Mail Address ....

Thank you for participating in this research. All information collected will be treated in the strictest confidence, will be stored securely and finally will be disposed of appropriately on conclusion of the study.

Developing a Sustainable Investment Appraisal Framework

Background Introduction to the Research and this Survey

The following factors have been identified as having relevance to the Twin Valley Homes decision making process relating to strategic investment appraisal. In an attempt to develop a framework, which will assist the senior management team to make the case for investment it is necessary to seek your views on the significance of the factors listed below. The results of the questionnaire will then inform how Twin Valley Homes how to appraise the sustainability of their neighbourhoods and eventually how it can prioritise and make the case for further neighbourhood investment.

Thank you for taking the time to help with this important research.

Instructions for completing the survey.

Please place a tick in a box that best expresses your assessment of each criteria's importance on a scale between 5(critical) and 1 (not relevant) if you deem the indicator not to be relevant please leave it blank.

1 – Built Environment

	Critical		Neutral		Not very relevant
Maintenance Expenditure	☐	☐	☐	☐	☐
Regulatory Compliance	☐	☐	☐	☐	☐
SAP Rating (energy efficiency)	☐	☐	☐	☐	☐
Housing Balance	☐	☐	☐	☐	☐
Void Expenditure	☐	☐	☐	☐	☐
Property Condition	☐	☐	☐	☐	☐
Property Size	☐	☐	☐	☐	☐

2 – Local Environment

	Critical		Neutral		Not very relevant
Presence of derelict land	☐	☐	☐	☐	☐
Estate Design and Layout	☐	☐	☐	☐	☐
Upkeep of local environment	☐	☐	☐	☐	☐
Upkeep of public spaces	☐	☐	☐	☐	☐
Boarded up properties	☐	☐	☐	☐	☐
Extent of fly-tipping	☐	☐	☐	☐	☐
Provision of on road parking	☐	☐	☐	☐	☐
Levels of garden upkeep	☐	☐	☐	☐	☐
Estate Lighting	☐	☐	☐	☐	☐
Levels of dog fouling/Littering	☐	☐	☐	☐	☐
Provision of Off-road parking	☐	☐	☐	☐	☐
Estate Appearance	☐	☐	☐	☐	☐

3 - Market Dynamics

	Critical		Neutral		Not very relevant
Void Periods	☐	☐	☐	☐	☐
Refusal to select neighbourhood	☐	☐	☐	☐	☐
Prevalence of vacant properties	☐	☐	☐	☐	☐
Rejections for accommodation	☐	☐	☐	☐	☐
Waiting list length	☐	☐	☐	☐	☐
Average tenancy length	☐	☐	☐	☐	☐
Number of new tenancies	☐	☐	☐	☐	☐
Number of transfer requests	☐	☐	☐	☐	☐
Number of terminated tenancies	☐	☐	☐	☐	☐
Number of Applications	☐	☐	☐	☐	☐

4 – Local Economy

	Critical		Neutral		Not very relevant
Private rental units (% of stock)	☐	☐	☐	☐	☐
Tenure mix	☐	☐	☐	☐	☐
Provision of local shops	☐	☐	☐	☐	☐
Benefit Dependency levels	☐	☐	☐	☐	☐
Unemployment levels	☐	☐	☐	☐	☐
Employment opportunities	☐	☐	☐	☐	☐

5 – Society and Community

	Critical		Neutral		Not very relevant
Community Centres/Facilities	☐	☐	☐	☐	☐
Social exclusion	☐	☐	☐	☐	☐
Mix of Community	☐	☐	☐	☐	☐
Services for young people	☐	☐	☐	☐	☐
Fear of Crime	☐	☐	☐	☐	☐
Fear of anti-social behaviour	☐	☐	☐	☐	☐
Access to support services	☐	☐	☐	☐	☐
Community spirit	☐	☐	☐	☐	☐
Levels of anti social behaviour	☐	☐	☐	☐	☐
Community Pride	☐	☐	☐	☐	☐
Crime levels	☐	☐	☐	☐	☐

6 – Governance

	Critical		Neutral		Not very relevant
Partnership working	☐	☐	☐	☐	☐
Tenant Involvement	☐	☐	☐	☐	☐
Tenant consultation	☐	☐	☐	☐	☐

Conclusion

Please make any other comments you feel may be relevant.

Thank you for participating in this research. All information collected will be treated in the upmost confidence, will be stored securely and finally will be disposed of appropriately on conclusion of the study.

Developing a Sustainable Investment Appraisal Framework

<u>Background Introduction to the Research and this Survey</u>

The following factors have been identified as having relevance to the Twin Valley Homes decision making process relating to strategic investment appraisal. In an attempt to develop a framework, which will assist the senior management team to make the case for investment it is necessary to seek your views on the significance of the factors listed below. The results of the questionnaire will then inform how Twin Valley Homes how to appraise the sustainability of their neighbourhoods and eventually how it can prioritise and make the case for further neighbourhood investment.

Thank you for taking the time to help with this important research.

<u>Instructions for completing the survey.</u>

From the analysis of the first round of data collection, the features of sustainability have now been re-ordered based on the mean rankings discovered. These have been pre-selected for you. If you agree with these rankings, please do nothing and return the survey. Alternatively if you feel the rankings are incorrect please rearrange by completing the boxes to the right.

1 – Built Environment

	Ranking	Revised Ranking
SAP Rating (energy efficiency)	1	
Housing Balance	2	
Property Size	3	
Void Expenditure	4	
Property Condition	5	
Maintenance Expenditure	6	
Regulatory Compliance	7	

2 – Local Environment

	Ranking	Revised Ranking
Provision of Off-road parking	1	
Provision of on-road parking	2	
Estate Design and Layout	3	
Estate Lighting	4	
Presence of derelict land	5	
Levels of garden upkeep	6	
Upkeep of local environment	7	
Upkeep of public spaces	8	
Levels of dog fouling/Littering	9	
Boarded up / abandoned properties	10	
Extent of fly-tipping	11	
Estate Appearance	12	

3 – Market Dynamics

	Ranking	Revised Ranking
Average tenancy length	1	
Number of new tenancies	2	
Number of transferred tenancies	3	
Number of Applications	4	
Refusal to select neighbourhood	5	
Number of terminated tenancies	6	
Prevalence of vacant properties	7	
Waiting list length	8	
Rejections for accommodation	9	
Void Periods	10	

4 – Local Economy

	Ranking	Revised Ranking
Private rental units (% of stock)	1	
Tenure mix	2	
Provision of local shops	3	
Benefit Dependency levels	4	
Unemployment levels	5	
Employment opportunities	6	

5 – Society and Community

	Ranking	Revised Ranking
Community Centres/Facilities	1	
Social exclusion	2	
Mix of Community	3	
Services for young people	4	
Fear of Crime	5	
Fear of anti-social behaviour	6	
Access to support services	7	
Community spirit	8	
Levels of anti social behaviour	9	
Community Pride	10	
Crime levels	11	

6 – Governance

	Ranking	Revised Ranking
Partnership working	1	
Tenant Involvement	2	
Tenant consultation	3	

Conclusion

Please make any other comments you feel may be relevant.

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Thank you for participating in this research. All information collected will be treated in the upmost confidence, will be stored securely and finally will be disposed of appropriately on conclusion of the study.

Appendix 5–Inital Mapping of Theoretical Nodes

Carter and Fortune (2008)	Hill and Bowen (1997)	Long and Hutchins (2003)	The Audit Commission (2005) Local Quality of Life Indicators
Aesthetic design and detailing	Quality of Life	void periods	concern about racial attacks
Choice of materials	Social Self Determination and Cultural Diversity	long term voids	Community activities
Contribution to neighbourhood	Human Health - Healthy work environments	Prevalence of vacant properties	Election Turnout
Flexibility and adaptability	Skills Training	Turnover (%)	Feeling safe at day and night
Health promoting housing	Equal distribution of construction social costs	Waiting Lists and Supply	Burglary rates/1000 households
Integration of safety and security	Equitable distribution of construction social benefits	Transfer Requests	Violent offences/1000 households
Maintenance and aging of buildings	Intergenerational equity	Voluntary Purchase Applications	Vehicle Theft . 1000 households
Replicability of project	Reduce Raw Material Usage	Relevative House Price Levels	Sexual offences / 1000 households
Affordable sites in areas of need	Water conservation	Low Value Sales	Vandalism, graffiti and deliberate damage
Close proximity of contractors	Energy conservation	Relative Levels of Rental Price	Drug dealing
Density linked to demand	Material conservation	Aspirational demand	Public Order Problems
Integrated within community	Land Conservation	Likely household formation	Pedestrian and Cyclist Injury/100,000 population
Links to transport network	Renewable resources used	Population Estimates/Projection	% of people <20mins from sport facility
Local benefits of project	Healthy (non-toxic environments)	Population Density	Improvement in facilities for teenagers
Redevelopment of sites	Ecological Diversity	Rejections of accommodation	improvement in facilities for children
Site orientation and amenity	Minimize damage to environment	Adverse reasons for leaving	improvement in Cultural facilities
Contractors site operations	Financial affordability	Refusals	improvement in sport and leasure facilities
Cost savings through supply chain	employment creation	Surveys of resident satisfaction	improvement in parks and open spaces
Funding sites with mixed use	Full Cost Accounting /Real Cost Pricing	Number of crimes	Employment rate
Inclusion of local labour/contractors	Increase competitiveness	Neighbourhood Disputes	Jobs seekers allowance claims/% of working pop
Innovation through supply chain	Environmentally responsible supply chain	Fear of Crime	% out of work for >1 year
Renewable materials	Trade off unsustainable material use with socio-economic investment	Rent arrears	Nr of VAT registered businesses
Transport of materials	durable, reliable and functional buildings	Council tax rebates	% change in nr of VAT registered businesses
Cost implications of transport issues	quality in Built Environment	Housing Benefit claims	Job Density
Integrated within community	Use Serviceability to promote sustainable construction	Income support claims	Living in worst 10% of Indices of multiple deprivation
Linked to transport network	Humanise larger buildings	Free School Meals	% of population claiming key benefits

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Reduction in car use	Mixed Use Developments/Brownfield Development	Unemployment	% of children/over 60s in income deprived households
Transport consequences of development process		Household Income	% of 1/2 day school attendance missed
Adaptability		Educational attainment	% of 16-24 yr olds in full-time education
Demolition and demountability		Standardised Mortality Ratios	Nr of working pop educated to NVQ 2; NVQ 4
energy from renewable sources		Morbidity	% of 15 yr olds in schools attaining >5 GCSE A*-C
funding sites with mixed use		Accessibility of Facilities	Proportion of Derelict Land
life cycle expectations		Availability of Employment	Levels of littering and other detritus
Recycled materials		Access to means of transport	Air pollution levels
Recycling by occupants		Proportion of Derelict Land	Carbon Dioxide Emissions/Per capita emissions
Cost effective to build		Burnt out/ Boarded up Property	Gas/Electric annual household consumption
Individual affordability		Extent of Fly tipping	Daily water usage
Private funding		Extent of Noise Pollution	Water Quality (Rivers)
Public funding		Repair costs and repair types	Household waste volumes/recycling
Running costs of property		Households lacking basic amenities	% of land designated as SSSI in LA area
Small incremental change		Stock Condition	Mortality Rates (cancer, Circulatory diseases; Respiratory
Sustaining local economy		Housing Quality Indictors	Infant Mortality
Alternative fuels		Attendance at community meetings	Life Expectancy at Birth
Avoidance of fuel poverty		Electoral Turnout	% of households with 1+ suffering limiting long-term illness
Building orientation		Extent of community spirit	Pregnancy <18 yrs/1000 female population (15-17)
Earth moving minimized		Mix of the community	House completions (Nr)
Education on energy use			Affordable Housing/% total
Efficient transport policy			Housing without central heating
Improved boilers			Homelessness in local area
Low embodied energy			Unfit Housing
Reducing use of water			House Price/ Income ratio
Thermal performance			Commute (% car: % Public Transport; % cycle/walk)
			% travelling >20km to work
			% residents identified improvements in: public transport; traffic congestion

			Traffic Flows/million vehicle km
			Community mix
			local decision making / local influence/consultation
			Access to key services (% residents satisfied)
			Childcare Places (Nr)

Treanor and Walker (2004)	Egan (2004)	Green et al (2005)	governments list of Sustainable Development Indicators (DEFRA (2010)	Turcu's (2010:2013)
void periods	% people in most deprived wards	Social contact	Greenhouse Gas Emissions	LA Services
long term voids	Resident satisfaction (%)	Trust	CO_2 Emissions by end user	Community Involvement
Prevalence of vacant properties	Happy with area (%)	Participation	Aviation and shipping emissions	Partnerships
Turnover (%)	Key priorities for area improvement	Employment	Renewable energy	Sense of community
Number of Homeless applicants	Feeling of belonging (%)	Skills	Electricity Generation	Crime and Safety
Number of Homeless in priority need	Community Integration (%)	Health	Household Energy Use	Moving patterns
Transfer Requests	Community involvement	Housing	Road Transport	Tenure Mix
Voluntary Purchase Applications	Satisfaction for LA services	Workplaces	Private Cars	Income Mix
Relevative House Price Levels	Anti-social Behaviour Problems	Facilities	Road Freight	Ethnic Mix
Low Value Sales	Burglaries/1000 households	Shops	Manufacturing sector	Local Jobs
Relative Levels of Rental Price	Feeling of safety (night/day)	Roads	Service sector	Access to jobs
Aspirational demand	LA service satisfaction	Parks	Public Sector	Business activity
Likely household formation	Comprehensive performance score - services	Street Scape	Resource use	Training/Skills
Population Estimates/Projection	Comprehensive performance score - ability to improve	Open space	Energy supply	House Prices
Population Density	LA - resident communication	Satisfaction with Neighbourhood	Water resource use	Housing affordability
Ave rent as % of vacant possession value	Local influence over decisions	Change in Satisfaction with Neighbourhood	Domestic water consumption	Use of energy
Length of residence	Household energy use	Satisfaction with Home	Water stress	Use of water
Right to buy levels	Household water use	Likleyness to stay in neighbourhood.	Waste	Waste recycling
Rates of abandonment	LA owned land without conservation status - used for biodiversity		Household waste per person	Housing and area condition
% of stock overcrowded	Housing completions (>Code 3 CFSH)		Bird populations	Housing state of repair
% tenants resident for <2 years	Recycling facilities		Biodiversity conservation	Satisfaction with own home
Rejections of accommodation	LA Brownfield development land		Agriculture sector	Green Open Space
Adverse reasons for leaving	Ave days of air pollution		Farming and Environmental Stewardship	Services and Facilities
Refusals	Waste not recycled (% tonnage)		Land use	Schools
Surveys of resident satisfaction	Noise pollution		Land recycling	GP / Health Services
Number of notices served	Non-decent housing / Unfit housing		Dwelling density	Public Transport
Other Stakeholders perception of area	Littering and Detritus levels		Fish Stocks	

Number of crimes	Resident satisfaction with area cleanliness		Ecological impacts of air pollution	
Neighbourhood Disputes	Property Values / Property values/earnings ratio		Emissions of air pollution	
Fear of Crime	Satisfaction with housing		River quality	
Incidents of vandalism/graffiti	Ave length of stay in temporary accommodation		Flooding	
Number of ASBOs served	Percentage of parks/open spaces achieving green flag award		Economic output	
Nr of target families for ASBOs	Listed building at risk of decay (%)		Productivity	
Cases of Health enforcement action	Access to services; within 15 minutes walk		Investment	
Proportion of Derelict Land	Access to transport		Demography	
Burnt out/ Boarded up Property	Satisfaction with public transport provision		Households and Dwellings	
Extent of Fly tipping	Percentage of homes with broadband access		Active community participation	
Extent of Noise Pollution	Educational attainment (Lit/Nurm @ L1; NVQ2; NVQ3)		Crime	
Incidence of traffic/parking problems	Employment levels		Fear of Crime	
Complaints about communal areas	Ave. Annual earnings (full-time; full-time males; part-time males)		Employment	
Play areas/equipment	Business satisfaction with community/area		Workless households	
Density and Dspersment of stock	Regional GDP / Population		Economically inactive	
Protecting diversity of nature	Educational attainment (Primary school)		Childhood Poverty	
Condition of street furniture	Educational Attainment (GCSE 5 x A*-C)		Young adults	
Extent of communal areas expensive/difficult to maintain	Life Expectancy		Pensioner poverty	
Household energy use	Conception rates (<18 years)		Pension provision	
Household water use	Waiting time for treatment		education	
% of homes meeting Code for Sustainable Homes	Primary care professionals/100,000 population		sustainable development education	
% of people satisfied with recycling facilities	Major Planning application decision periods		Health inequality	
% of homes built on Brownfield land	User satisfaction with Town Centre		Healthy life inequality	
% of household waste recycled			Mortality rates	
Ave days of moderate/high air pollution			smoking	
Repair costs and repair types			childhood obesity	
Households lacking basic amenities			Diet	
Stock Condition			Mobility	

Housing Quality Indictors			Getting to school	
Stock SAP rating			Accessibility	
Proportion of marked car parking spaces			Road Accidents	
Nr of Demolitions			Social Justice	
Property Type			Environmental equity	
Nr of unfit/non-decent homes			Air quality and health	
Planned maintenance expenditure/unit			Housing conditions	
Responsive maintenance expenditure/unit			Households living in fuel poverty	
% of grade 1/2 listed property at risk of decay			Homelessness	
Attendance at community meetings			Local environmental quality	
Electoral Turnout			Satisfaction with local area	
Extent of community spirit			UK International assistance	
Tenure breakdown			Wellbeing	
Migration patterns				
Census breakdowns				
Demographic Trends				
Household Trends				
Rent arrears				
Council tax rebates				
Housing Benefit claims				
Income support claims				
Free School Meals				
Unemployment				
Household Income				
Educational attainment				
Standardised Mortality Ratios				
Morbidity				
Conception Rates amongst females under 18				
Strategic commitment of local authority				

Insurance company risk data				
Wards in worst 10% of Indices of multiple deprivation				
Regeneration plans and Prospective for area				
Nr of primary care professionals per 100,000 residents				
Accessibility of Facilities				
Availability of Employment				
Access to means of transport				
LA comprehensive performance assessment scores				
% of dwellings with broadband internet access				
% satisfied with local area as business destination				
Council tax banding of properties				
Mix of community				
Issues with young people				

Appendix 6–Refined Mapping of Theoretical Nodes Prior to Reduction Coding.

Economy	Society	Natural Environment	Built Environment
void periods	Surveys of resident satisfaction	Proportion of Derelict Land	% of stock overcrowded
long term voids	Number of notices served	Extent of Fly tipping	Burnt out/ Boarded up Property
Turnover (%)	Other Stakeholders perception of area	Household energy use	Complaints about communal areas
Number of Homeless applicants	Number of crimes	Household water use	Density and dispersment of stock
Relative House Price Levels	Neighbourhood Disputes	% of homes meeting Code for Sustainable Homes	Extent of communal areas expensive/difficult to maintain
Low Value Sales	Fear of Crime	% of people satisfied with recycling facilities	Households lacking basic amenities (Nr)
Relative Levels of Rental Price	Vandalism, graffiti and deliberate damage	% of homes built on Brownfield land	Stock Condition
Aspirational demand	Anti-social Behaviour Problems	% of household waste recycled	Housing Quality Indictors
Ave rent as % of vacant possession value	Nr of target families for ASBOs	Ave days of moderate/high air pollution	Nr of Demolitions
Length of residence	Incidence of traffic/parking problems	Local environmental quality/condition	Property Type(s)
Right to buy / Voluntary Purchase Applications	Extent of community spirit	Green Open Space	Nr of non-decent homes
Rates of abandonment	Tenure Mix	Noise pollution	Planned maintenance expenditure/unit
% tenants resident for <2 years	Wards in worst 10% of Indices of multiple deprivation	Protection and enhancement of ecology	Responsive maintenance expenditure/unit
Population Density	Accessibility of Facilities	Renewable Technologies/energy	Listed building at risk of decay (%)
Migration patterns	Mix of community/ethnic mix	Energy White Labelled appliances	Satisfaction with housing
Demographic Trends	Issues with young people	Outside Drying Space	Home user guide
Rent arrears	Community Involvement/participation	Energy display devices	Responsible construction practices
Council tax rebates	Availability of Services	Water Meter	Construction site impacts
Housing Benefit claims	Childhood Poverty	Surface water run off	Day lighting
Income support claims	Young adults	Flooding	Sound Insulation
Household Income/Income Mix	Pensioner poverty	Construction site waste	Inclusive design
Insurance company risk data	Social Justice	Greenhouse Gas Emissions	Ventilation

Availability of Local Employment	Households living in fuel poverty	CO$_2$ Emissions by end user	Safety
% of dwellings with broadband internet access	Homelessness in local area	Aviation and shipping emissions	Lighting
% satisfied with local area as business destination	Satisfaction with local area	Electricity Generation	Energy Efficiency (Improvements)
Council tax banding of properties	Social contact	Energy supply	Energy Efficiency (SAP Rating)
Business activity	Trust	Water stress	Street Scape
Housing affordability	Change in Satisfaction with Neighbourhood	Bird populations	Housing completions (>Code 3 CFSH)
Likely household formation	Likeliness to stay in neighbourhood.	Agriculture sector	House completions (Nr)
Population Estimates/Projection	% people in most deprived wards	Farming and Environmental Stewardship	Affordable Housing/% total
Rejections of accommodation	Feeling of belonging (%)	Land use	Housing without central heating
Adverse reasons for leaving	Burglaries/1000 households	Fish Stocks	durable, reliable and functional buildings
Transfer Requests	Feeling of safety (night/day)	Water Quality (Rivers)	quality in Built Environment
Properties with a Home Office	Access to services; within 15 minutes walk	Environmental equity	Use Serviceability to promote sustainable construction
Manufacturing sector	User satisfaction with Town Centre	Parks	Humanise larger buildings
Service sector	concern about racial attacks	LA owned land without conservation status - used for biodiversity	Mixed Use Developments/Brownfield Development
Public Sector	Violent offences/1000 households	LA Brownfield development land	Aesthetic design and detailing
Resource use	Vehicle Theft . 1000 households	Littering and Detritus levels	Choice of materials
Economic output	Sexual offences / 1000 households	Resident satisfaction with area cleanliness	Contribution to neighbourhood
Productivity	Drug dealing	Percentage of parks/open spaces achieving green flag award	Flexibility and adaptability
Investment	Public Order Problems	improvement in parks and open spaces	Health promoting housing
Unemployment - Workless households	% of people <20mins from sport facility	% of land designated as SSSI in LA area	Integration of safety and security
Economically inactive	Improvement in facilities for teenagers	Reduce Raw Material Usage	Demolition and demountability
Pension provision	improvement in facilities for children	Land Conservation	life cycle expectations
Shops	improvement in Cultural facilities	Renewable resources used	
Ave length of stay in temporary accommodation	improvement in sport and leisure facilities	Healthy (non-toxic environments)	
Regional GDP / Population	Social Self Determination and Cultural Diversity	Ecological Diversity	

Jobs seekers allowance claims/% of working pop	Equal distribution of construction social costs	Minimize damage to environment	
Unemployment - % out of work for >1 year	Equitable distribution of construction social benefits	Building and Site orientation and Amenity	
Nr of VAT registered businesses	Intergenerational equity	Recycled materials	
% change in nr of VAT registered businesses	Integrated within community	Earth moving minimized	
Job Density	Local benefits of project	Education on energy use	
Waiting Lists and Supply	Inclusion of local labour/contractors	Improved boilers	
Financial affordability	Number of Homeless in priority need	Low embodied energy	
employment creation		Thermal performance	
Full Cost Accounting /Real Cost Pricing			
Increase competitiveness			
Environmentally responsible supply chain			
Trade off unsustainable material use with socio-economic investment			
Affordable sites in areas of need			
Close proximity of contractors			
Density linked to demand			
Cost savings through supply chain			
Funding sites with mixed use			
Cost implications of transport issues			
Cost effective to build			
Individual affordability			
Private funding			
Public funding			
Running costs of property			
Sustaining local economy			

Infrastructure	Governance		
Proportion of marked car parking spaces	Attendance at community meetings		
Condition of street furniture	Election Turnout		
Access to means of transport	Strategic commitment of local authority		
Public Transport	Regeneration plans and Prospective for area		
Play areas/equipment	LA Services		
Cycle Storage	Project Management		
Road Transport	Innovation		
Private Cars	UK International assistance		
Road Freight	Key priorities for area improvement		
Accessibility	Satisfaction for LA services		
Road Accidents	Comprehensive performance score - services		
Roads	Comprehensive performance score - ability to improve		
Satisfaction with public transport provision	LA - resident communication		
Pedestrian and Cyclist Injury/100,000 population	Local influence over decisions		
Commute (% car: % Public Transport; % cycle/walk)	Major Planning application decision periods		
% travelling >20km to work	Contractors site operations		
% residents identified improvements in: public transport; traffic congestion	Innovation through supply chain		
Traffic Flows/million vehicle km			
Links to transport network			
Transport of materials			
Reduction in car use			
Transport consequences of development process			
Efficient transport policy			

Appendix 7– Data analysis for Delphi Study (Round 2)

Feature 1: Built Environment

Generally, the ranking established by the group as a result of questionnaire one has proved acceptable to the group. although respondent 14 felt *void expenditure* was a principle indicator of sustainability within the stock. They further suggested that *regulatory compliance* was the fourth most important feature, thus relegating *energy efficiency* to 'least important' in the ranking. Despite these changes, the analysis of the ranking data from questionnaire two indicates a high level of consensus within the organisation.

		Mean Rank	Kendall's W (Significance)
1	Energy Efficiency	6.88	
2	Housing Balance	6.00	
3	Property Size	5.00	
4	Void Expenditure	3.88	
5	Property Condition	3.00	
6	Maintenance Expenditure (£/yr)	2.00	
7	Regulatory Compliance	1.29	0.929 (<0.01)

Table 1: Iteration 2 - ranking of Built Environment Sub-Nodes

Feature 2: Local Environment

Once again, the rankings generated by the group as a result of questionnaire one have proved acceptable, although respondent 3 suggested '*littering, dog fouling, graffiti etc.*' was slightly more important than '*Boarded up/abandoned properties*' with those two sub-nodes swapped around. Despite these changes, the analysis of the ranking data again indicates a high level of consensus within the organisation.

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		Mean Rank	Kendall's W (Significance)
1	Off-Road parking	12.00	
2	On-road parking provision	11.00	
3	Estate Design & Layout	10.00	
4	Lighting levels	9.00	
5	Presence of derelict land	8.00	
6	Garden upkeep	7.00	
7	Upkeep of local environment	6.00	
8	Upkeep of public spaces	5.00	
9	Littering, Dog Fouling, Graffiti etc.	3.96	
10	Boarded up/abandoned properties	3.04	
11	Extent of fly tipping	2.00	
12	Estate appearance	1.00	0.999 (<0.01)

Table 2: Iteration 2 - ranking of Local Environment Sub-Nodes

Feature 3: Market Dynamics

The rankings generated by the group as a result of questionnaire one have once again proved acceptable, although respondent 22 suggested '*average tenancy*' was distinctly more important than '*prevalence of vacant properties*' with those two sub-nodes swapped. Despite these changes, the analysis of the ranking data indicates a high level of consensus within the organisation.

		Mean Rank	Kendall's W (Significance)
1	Average tenancy length	9.77	
2	Number of new tenancies	9.00	
3	Number of transferred tenancies	8.00	
4	Number of applications	7.00	
5	Refusal to select neighbourhood	6.00	
6	Number of terminated tenancies	5.00	
7	Prevalence of vacant properties	4.23	
8	Waiting List Length	3.00	
9	Rejections for accommodation	2.00	
10	Void Periods	1.00	0.968 (<0.01)

Table 3: Iteration 2 - ranking of Market Dynamic Sub-Nodes

Feature 4: Local Economy

The rankings generated by the group as a result of questionnaire one have once again proved acceptable with no changes proposed. Therefore the analysis of the ranking data indicates a high level of consensus within the organisation.

		Mean Rank	Kendall's W (Significance)
1	Private Rental Units	6.00	
2	Tenure Mix	5.00	
3	Provision of Local Shops	4.00	
4	Benefit dependency levels	3.00	
5	Unemployment levels	2.00	
6	Employment opportunities	1.00	1.000 (<0.01)

Table 4: Iteration 2 - ranking of Market Dynamic Data Sub-Nodes

Feature 5: Society and Community

The rankings generated by the group as a result of questionnaire one have once again proved acceptable with no changes proposed. Therefore the analysis of the ranking data indicates a high level of consensus within the organisation.

		Mean Rank	Kendall's W (Significance)
1	Community centres/facilities	11.00	
2	Social Exclusion	10.00	
3	Mix of community	9.00	
4	Services for young people	8.00	
5	Fear of Crime	7.00	
6	Fear of Anti-social behaviour	6.00	
7	Access to support services	5.00	
8	Community spirit	4.00	
9	Level of Anti-social behaviour	3.00	
10	Community pride	2.00	
11	Crime statistics	1.00	1.000 (<0.01)

Table 5: Iteration 2 - ranking of Society and Community Sub-Nodes

Feature 6: Governance

The rankings generated by the group as a result of questionnaire one have once again proved acceptable with no changes proposed. Therefore the analysis of the ranking data indicates a high level of consensus within the organisation.

		Mean Rank	Kendall's W (Significance)
1	Partnership Working	3.00	
2	Tenant Involvement	2.00	
3	consultation	1.00	1.000 (<0.01)

Table 6: Iteration 2 - ranking of Society Sub-Nodes