Beyond mitigation. Co-habiting with Climate Change

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BEYOND MITIGATION.

Co-habiting with Climate Change

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In light of the most recent natural disasters, we are called to reflect upon the role that architecture city and landscape play in the relationship between human beings and their environment because it is within this relationship that we can find new ways to pursue our needs while ensuring the survival of our planet.

Climate change is yet another wakeup call that draws the attention towards the pressing need to change the way we consume natural resources and dispose of our waste, but it is certainly not the first. In the late Eighteenth Century in his "Essay on the Principle of Population" (1798) Thomas Malthus, wrote that *"The power of population is indefinitely greater than the power in the Earth to produce subsistence for man."* (MALTHUS, 1878), highlighting the trend and the risks of human evolution based on exponential and unlimited growth, and the incapacity of the earth to provide resources for people - which were, and still are, reproducing at geometrical rate[1] - and fulfil their needs. In the 1960s with her epic book (CARSON, 1962), Rachel Carson warned us about the consequences of chemical pollution of fauna and flora. Only ten years later Buckminister Fuller was comparing our planet to a "Spaceship" and pointing out that the resources we are carrying on our spaceship are limited. (FULLER, 1969) Again in the 1970's the oil crisis brought to our attention the utter dependence we have on from fossil fuels and the need to consume less energy, and consequently find more sustainable ways of producing it. However, it is the century we live in, the Twenty-first century, that has marked the most important findings, and initiatives addressed towards environmental problems, possibly because the last century witnessed an exponential increase and acceleration of natural disasters.

Fig. 1. Book covers. Source: Author.

[1] *Although Malthus' observations concern mostly population growth and food availability, it is a key moment in the emergence of issues related to sustainability because it is acknowledging one of the consequences of Industrial Revolution and technological advancement.*

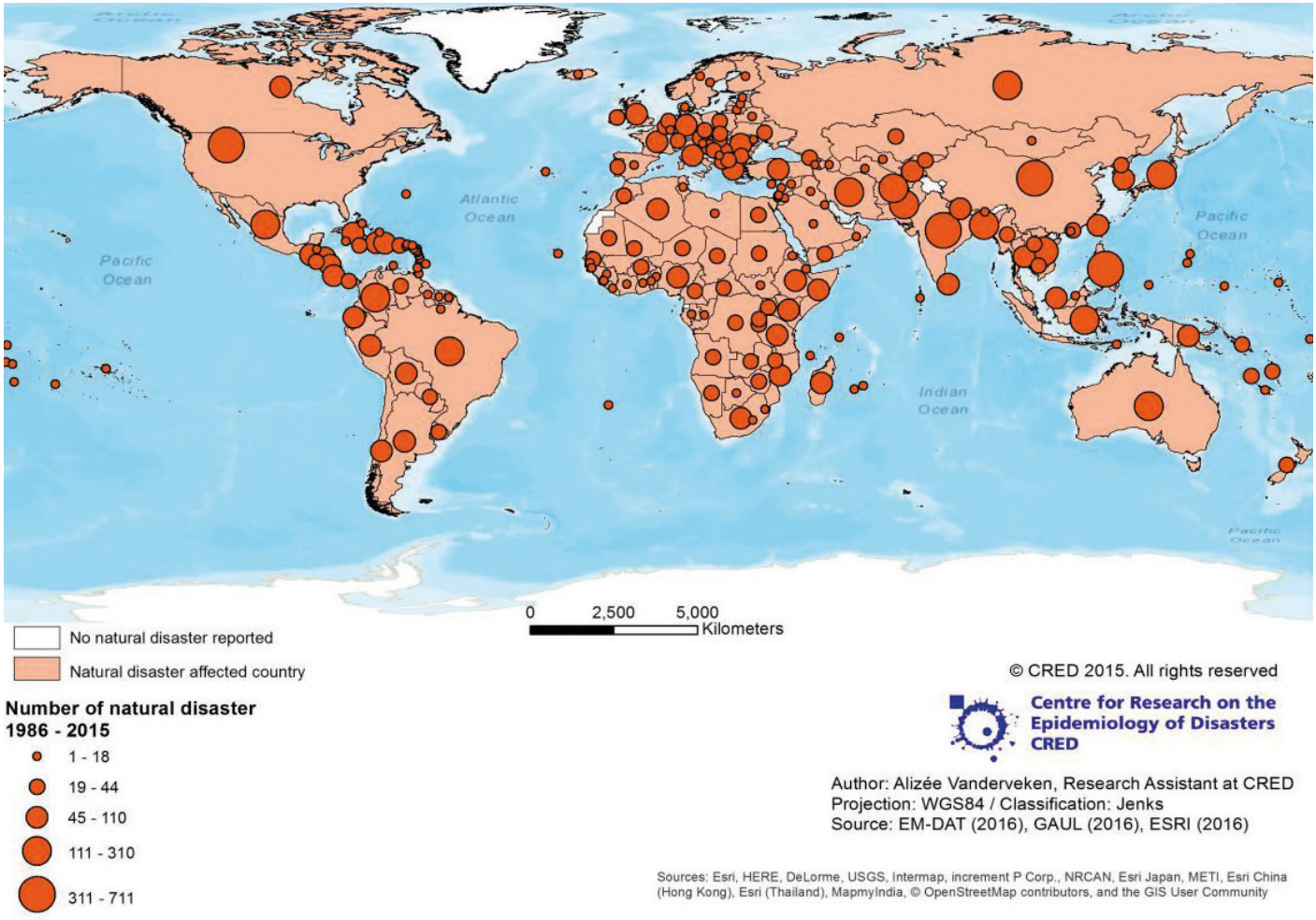

Fig. 1. Book covers. Source: Author.

After over fifty years of research and policies about sustainability, one thing is certain: *We are the cause of irreversible changes.*

If we want to set up a starting point to approach the complex topic of our impact on the environment and the possible approaches to reverse the destructive trends we have activated, we must first consider two intrinsic aspects of the discussion: environmental threats are a dynamic and un-predictable problem, and they interact at different scales, with an exponential acceleration. (PEDATA, 2019)

The first thing we need to acknowledge is that we are dealing with dynamic problems such as climate and biodiversity; hence we cannot predict future trends. Risk is not measurable. The Back Swan[2] problem illustrates how it is impossible to calculate the risk of rare consequential events and predict their occurrence. The above is true of all complex systems where an extremely large number of interdependencies and nonlinear responses, makes it impossible to predict future trends or events. By looking at individual parts of the problem, or reducing everything to a linear problem, we would be operating a simplification. Hence, also complex systems like cities follow this logic and elude predictability; they have a life of their own and we cannot be so presumptuous to expect to drive their evolution. (TALEB, 2013) All phenomena in our ecosystem, including artificial environments created by men, are a result of synergies[3]. In a complex system there is no such thing as a cause to a certain response; there are a set of unpredictable interconnected cascading behaviours (TALEB, 2013, p. 122). If we start thinking about the consequences of our everyday actions, how they are all linked and cause a chain reaction of feedback mechanisms that ultimately have an irreversible impact on the environment, we might even end up feeling helpless, frustrated, and paralysed by the complexity of the environmental issues we are facing. (MAAS, HAIKOLA, HACKAUF, & THACKARA, 2010)

Secondly, what makes the topic even more complex is the fact that we are witnessing a great

[2] *"Black swans" are large-scale unpredictable and irregular events of massive consequence. (TALEB, 2013, p. 6)*

[3] *"Behavior of whole systems unpredicted by the separately observed behaviors of any of the system's separate parts or any subassembly of the system's parts" (FULLER, 1969).*

acceleration in the development of the threats to our environment. The speed at which all the changes are taking place is increasing exponentially every year. The above condition makes it all the more difficult to promptly set up strategies to address the issues at hand. The number of natural disasters such as droughts, tsunamis, hurricanes, typhoons, and floods has been increasing from 140 disaster occurrences per year in 1980 to 318 in 2018, which means that that they have more than doubled in the last 38 years[4]. Along with the number of disasters, the extent of damages and the financial resources needed to repair them (when possible) are also increasing. Among the most alarming consequences of natural disasters is the resulting displacement of the population, which causes political tensions and imposes stress on some developed countries if it is not well managed. Hence we need better disaster preparedness and prevention programs, but also ways to deal with the displacement of the population and their precarious living conditions when they are left homeless.

RESPONSIBILITIES AND APPROACHES TO THE PROBLEM

We have established that we are the main cause of resource depletion, climate change, and the natural disasters that follow. We have also established that we are dealing with dynamic and accelerating problems. Consequently, the issue at hand remains to determine the possible solutions to such problems and the strategy to slow down and possibly reverse some of the destructive phenomena we have triggered. If we wish to find a solution to environmental problems, we need to operate major changes to production, supply, and consumption activities.

Nevertheless, the question is who should initiate and be responsible for such changes? There are those who believe the changes should be operated by individual behaviour and everyday actions, and those who believe we should be concerned with large-scale changes (policies, research and development, and infrastructural investments) (MAAS, HAIKOLA, HACKAUF, & THACKARA, 2010, p. 57) The danger is that focusing on individual behaviour (small steps) diverts attention from the larger picture (e.g. infrastructural projects, policies that regulate production and consumption, restrictions). The solution lies in a combination of all the above. Especially when dealing with the architectural and planning field, small tactics are not enough to deal with such complex problems. Global problems and shared problems cannot be solved through small scale individual behaviour changes and independent tactics; in such cases, regulations and standards are indeed required.

So far the main approaches proposed and adopted towards environmental problems fall in two main categories: mitigation, policies, codes and laws to regulate energy consumption and Co2 Emissions; and adaptation, strategies aimed at improving the resilience of the social infrastructure. In the current scenario, strategies of mitigation are no longer enough to reverse the trend of climate change and natural disasters. Our impact on the planet seems to have reached such an extent that the only solutions seem to be adapting to the new conditions and development of adaptation tactics aimed at the improvement of systems' resiliency. Hence, we should

[4] *Data from the Emergency Events Database (EM-DAT), launched in 1988 by the Centre for Research on the Epidemiology of Disasters (CRED). (https://www.emdat.be/database). In the database, an event is categorized as a natural disaster if it kills 10 or more people or leaves at least 100 people injured, homeless, displaced or evacuated.*

start considering the major shifts in climatic patterns when we design buildings and settlements, and stop seeing buildings as static objects, but rather as flexible and continuously evolving artefacts. In short, we should overcome climate responsive design in favour of climate-resilient design. What this would entail is that we can no longer design buildings based on the climatic regions and climate data proposed by Olgyay (OLGYAY, 2015) or later on by Hausladen (HAUSLADEN, LIEDL, & DE SALDANHA, 2012), and we might have to start designing buildings that not only respond to current conditions but can also adapt, and react to sudden climatic changes and exceptional phenomena.

CO-HABITATION

Just as adaptation goes beyond mitigation, co-habitation determines a substantially different approach towards environmental threats and natural disasters, an approach that does not promote mere coexistence - the often imposed action of living together without any productive interaction – but rather a peaceful coexistence that also promotes some form of exchange and added value. In this respect, architecture, city, and landscape should, from now on, approach emergencies fostering productive exchanges with the environment, securing not only our survival in case of natural disasters but also the endurance of a healthy and prosperous natural environment.

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