

CHAPTER 14

Green Building

A Continuous Journey of Improvement

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INTRODUCTION

Reading the preceding 13 chapters reveals snippets of a world that has gradually moved to embrace the concept of sustainable development and sustainability for its built environment. This is a critical move given that the built environment is both directly and indirectly responsible for adverse anthropogenic-driven, environment-linked global challenges. Among such global challenges is the pollution of water bodies and the atmosphere, and climate change. As the world reacts to the challenges in both the public and private spaces, there are lessons to be learnt on prudent approaches to this end.

The 2030 Agenda for Sustainable Development (AfSD) and its 17 sustainable development goals (SDGs) explicitly and boldly proclaim the desire to leave no one behind in its 15-year quest to improve the economic, social and environmental conditions of all humans during the period 2015 to 2030.¹ Improved cooperation within and among states, the private sector as well as local, regional, continental and international bodies is key in this endeavour. The objective is to deliver economic development and growth that address resource scarcity through improved resource efficiencies that minimise the adverse social and environmental outcomes.² The broad objectives of the 2030 AfSD are not new. A scrutiny of the agenda shows that it is addressing concerns raised previously in publications and meetings that include the 1962 book, *Silent Spring*, by Rachel Carson; the concerns of the Brundtland Commission; the 1992 Rio Summit; and most recently, the Millennium Development Goals (MDGs). Emphasised in the 2030 AfSD is the clarion call of “*leaving no one behind*”. If the intention is not to leave anyone behind, then it is reasonable to ask that everyone and everything contribute to advancing this global policy thrust, including through green

building. Consequently, an appropriate call to the implementation drive has to be “everyone and everything must contribute”. The word ‘must’ is deliberate. Its meaning and intention make actions obligatory, emphasising a necessity for consideration and leaving no options for either overlooking or missing a factor or action.

Humans are at the centre of the action concerned and indeed, they largely have been and still are the main drivers of some of the observed adverse conditions on earth. As the nerve centre of modern human economic and social activities, the built environment is a significant contributor to these conditions. This means that all the facets of this environment – from conception, through delivery (construction) and operation (occupation) to demolition or renovation – need to be understood to appropriately inform who and what must respond, as well as to direct the nature and scope of various responses. The preceding 13 chapters amply illuminated this. This concluding chapter raises, and to some extent responds to two basic but fundamental questions. The first question is: How is the construction industry addressing the sustainability issue? Answers to this question are in the book and this chapter compresses these to inform policy and practice. The second question is: Can things get better? This question arises because it is clear that the construction industry (the value chain) is still distant from being systemically green.

Given the different influences and preferences that characterise human beings, these two questions do not carry straight answers. This chapter only highlights what, in the opinion of the authors, is important. Readers are at liberty to expand and modify these as long as the objectives are to build green and deliver widespread and global green built environments. This is because both the routes and outcomes of the transition to green built environments will be different. This does not matter as long as being systemically green is the common denominator of the transition processes and outcomes. It is needless to indicate that there remains the option of having a massive scaling up in green building as multiple tipping points in this direction exist. Good examples of this include increasing the number of national green building policies already in adoption and implementation globally, the increase in green building councils and rating protocols, as well as the generally accepted global goal to intervene in the climate change space.

WHAT IS GOING ON?

The unequivocal picture painted in this volume is that the built environment and the construction industry are transforming themselves to contribute to delivering the objectives of sustainable development. The need for this transformation is beyond dispute. Chapter 2 presented the link between an unsustainable building industry, which gives rise to its output – an unsustainable built environment. Such a built environment accelerates global warming, which in turn ratchets up climate change. The chapter firmly establishes the impetus for the construction industry and the built environment to address climate change and related environmental, social and economic concerns. In this milieu, Chapter 2 presents the two-pronged approach that seeks to halt and/or retard the rate of environmental damage and aims to teach people to learn to live with the consequences of this damage. This is desirable.

Seeking to manage the risks associated with being named a laggard in this space, the drive to deliver green buildings and precincts is slowly shifting from a push by architects and environmentalists to a pull by user/buyer/owner-driven demand, as shown in Chapter 5. This chapter provides the relevant evidence of movement towards a systemically green construction value chain.

More important is the tangible evidence documented in the features of green infrastructure and practices in the built environment detailed in Chapters 6 to 12. Analysis of Chapters 6 to 12 shows a quest for resource efficiency as the core of delivering green infrastructure for the built environment. Although these chapters largely focus on South Africa, they nevertheless present important learning points for the world at large. For example, the prominence of energy efficiency is central to many resource-rich developing countries seeking to deliver modern forms of the built environment. In the envisaged modern forms of the built environment, an adequate and reliable supply of energy, particularly electricity, is a *sine qua non* for almost all forms of human social and economic functions. In the majority of cases, this energy comes from fossil sources whose use emits greenhouse gases (GHGs) that cause global warming, which in turn leads to climate change. In addition, the extraction of these sources carries a number of negative social and environmental consequences that in the long run, outweigh the immediate economic benefits. This demands an efficient use of such energy sources, to not only address their environmental impacts, but also to address the scarcity concern because these are finite resources. The use of renewable energy resources, as discussed in these chapters, is important in

stretching the availability of fossil energy resources along with addressing the energy-related GHG emissions concerns.

There is also a need to address efficiency in terms of water use in all operations in the value chain. This is critical, as the human population, rate of urbanisation and commercial and social demands for water increase and droughts linked to climate change strain water supplies also increases in both frequency and severity. The seven chapters (6-12) adequately cover the salient points around this aspect. The various discussions centre on design and equipment innovations that deliver increased water use efficiencies. Furthermore, there is a discussion referring to the use of resources in a manner that limits the generation of waste. This is important in a world that is now increasingly frowning upon the traditional waste disposal approach – dumping in landfills in the case of solid waste and channelling to sewerage treatment plants in the case of some liquid waste. Indisputably, these traditional waste disposal approaches are linked to the contamination of both surface and underground water sources (a scarce resource), the emission of GHGs, foul smells and ‘unproductive’ use of land (an increasingly scarce resource).³ The focus now is on reducing, reusing and recycling materials. Tacitly, this means that the concept of ‘waste’ changes. For example, the Parow Building (Chapter 11) has components designed for alternative use of waste when the time comes to either demolish or renovate the building. Environment House (Chapter 6) reuses some water harvested from its rooftop.

An important development in this space is the indication of the political will to drive the development and maturation of a green construction industry. Political will refers to the demonstrable and credible intent of political leadership and bureaucrats to undertake action that addresses the causes of problems.⁴ It comprises formulating and implementing policies that promote sustainable development, and in the context of this book, with a bias toward green building. This way, the green building evolution will take place even quicker. The policy cycle shows that formulating and implementing policies is not the responsibility of an individual political leader’s personal preferences, unless the political leadership is a totalitarian dictatorship with the means and ability to force these preferences on an entire jurisdiction.⁵ In this volume, there is demonstrable political will to deliver green building and green built environments. Evidence to this end is the range of public and private policies, legislation, codes and protocols – some mandatory and other voluntary – seeking a green construction industry, as detailed in Chapter 4. Most interesting is that the political will is present in both the developing and developed countries. Superficially, this is a case of everyone and everything contributing. This is because there is evidence

that the case countries in Chapter 4 also act in the wider sustainable development space outside the construction industry; i.e. they have wider GHG emissions mitigation programmes, initiatives to exploit renewable energy sources, reduce the generation of waste and improve their general resource use efficiencies.

CAN WE DO MORE?

The concept and aim of continuous improvement is to deliver better products and services through systemically efficient production and delivery processes. Innovation is central to this drive.⁶ In the contemporary world, continuous improvement applies to governments, companies, sports teams and individuals, students and communities. The drivers of improvement span the pecuniary, political and altruistic reasons that are an integral part of humanity. Irrespective of the reasons, these drivers are strong. Collectively, these drivers have given rise to product and service-improving management techniques that, among others, include the Kaizen and/or the Six Sigma approach and the Value-Stream Mapping analysis technique.⁷ Regardless of who or what needs improving and the underlying reasons for continuous improvement, the needs and reasons for these improvements eventually overlap and interact. This book vividly illustrates this. It elucidates how the narrow business interests of competitiveness and profitability in the construction industry interact with the broad issues of economic development and the green economy transition thrust that manages the climate change phenomenon in the context of the even broader sustainable development concern. These interactions and overlaps give rise to the concept of green building, also called green construction, leading to green (sustainable) built environments.

Indeed, there is a need to improve the scope and nature of green standards in the construction industry. This is important for systemically greening the construction value chain. An important consideration in this endeavour is seeking to ensure that the green building approach becomes an integral and inevitable consideration in all construction and renovation projects in private and public spaces. This means that green building becomes embedded in the DNA of both the global construction industry and the built environment. Currently, building green is voluntary and consequently, it has not gained the critical mass it requires to lower the cost of constructing green. The basis of such a critical mass is the economies of scale concept of microeconomics. The concept denotes the cost advantage a firm experiences when it increases its level of output.⁸ This advantage ascends because of the

inverse relationship between per-unit fixed cost and the quantity produced. The greater the quantity of output produced, the lower the per-unit fixed cost. Economies of scale also result in a fall in average variable costs (average non-fixed costs) with an increase in output. This results from operational efficiencies and synergies because of an increase in the scale of production. Put simply, the current relatively higher cost of building green compared to the traditional brown approach is due to the 'novelty' of the former, hence the relatively high cost of the associated green building input goods and services because of a low rate of use of these goods and services. Increasing the magnitude of their use will increase their production and *ceteris paribus* lower their cost. This is important to the localisation of some green input goods and services in the developing world.⁹ To achieve this, there is a need to improve the nature and scope of public and private sector policies, laws, protocols and codes, including promoting local green procurement. Currently, the cost of building green remains relatively high, especially in developing economies, given that the supply chain is still dominated by outside expertise and imported technologies. For example, at the time of completing this book, there was a paucity of solar panel manufacturers, even in a huge economy such as South Africa. Most of the solar panels are still imported from China and Germany.

Currently, and as shown in Chapter 4, the majority of what can be referred to as pivotal green building standards are voluntary. Subsequently, building green remains a 'goodwill' practice important on balance sheets and for the 'feel good' factor. Increasing the scope of obligatory green building standards may reverse this and thereby increase the magnitude of the input of green building goods and services, which ultimately may lower their cost. Cognisant of the hazards of over-regulation, rating bodies such as the International Organization for Standardization (ISO) and the various green building councils have to rethink and reformulate their images to increase the inclination to aim for and achieve standards that are higher than basic legislation. Rethinking and implementing the organisation and scope of both obligatory and voluntary high green building standards is

standards at every stage of the building lifecycle have to acknowledge and accommodate these differences.

SHUFFLING TOWARDS A GREEN BUILT ENVIRONMENT

A common thread in all of the 12 core chapters is the quest to ensure that the built environment reduces its adverse ecological footprints, albeit without compromising the comfort of humans in this environment. The policy, both in the private and public spaces, is clearly indicating a turn towards the green building trajectory. However, against the urgency of managing climate change, resource scarcity challenges and the broader drive for sustainable development, it is arguable that the turning angle is too wide. Consequently, the chances of shooting past the critical turning point are high. Against the background of the present and demonstrable political will to turn, the question is why this turn is laboured.

Exploring the often monolithically described concept of political will partially illuminates the related constraints. As mentioned earlier, outside an absolute dictatorship, political will reflects the wish of many actors that have different interests and views. Brinkerhoff¹⁰ views political will as an aggregate of four intertwined features: (i) individual actors with their aspirations, motivations and capacities; (ii) organisations represented by individual actors; (iii) socio-economic and governance systems framing constraints and incentives for individuals and organisation; and (iv) policies, programmes and activities identified, designed, implemented and evaluated by organisations and actors. Post *et al.*,¹¹ posit that these features give rise to three important analytical components of political will. The three are: political want, political can and political must. These components potentially explain the shuffle towards a systemically green value chain in the construction industry instead of the swift gallop one would expect against the urgent social, economic and most importantly, environmental concerns the latter approach could address and avert.

The first component of political will builds on the need (or lack of it) for actors – politicians in particular to formulate, implement and enforce certain policies. This is the political *want* component of political will.¹² The want manifests when there is an ample set of decision makers (elected and/or appointed leaders and civic societies, for example) who intend to support policy formulation, implementation and enforcing related activities.¹³ Is there enough *want* in the green building policy space? The plethora of both obligatory and voluntary private and public policies, protocols and codes advancing the green construction agenda suggest that the want is

abundant and clear. Despite this indication, the concept of green building remains relatively hidden compared to other pressing social, environmental and economic issues. Perhaps there is a limited 'want' on the demand side of the concept. Ideally, every office, factory, home, road, bus terminus or stop, airport and all infrastructure owners should be demanding green construction. Such a wide demand base may generate the required critical mass for a visible turn. This can arise if there is a wide and genuine desire to improve in this regard. This can be both voluntary and 'encouraged' through legislation that progressively becomes stringent. For example, the abandoning of the incandescent lightbulb started off as a voluntary action but is now obligatory in many countries and is now fully embedded in the green building revolution.

The second component of political will is political *can*, which pertains to capabilities and capacities to define a challenge, formulate and implement policies, as well monitor and evaluate the implementation and efficacy of policies. Capacity and capability refer to technical skill, mechanisms, resources, support, bureaucratic capacity and factors such as the legislative regimes, the prevailing socio-political atmosphere and how these affect the actions of all stakeholders concerned. The deficit of technical, bureaucratic and conducive socio-political capacities, capabilities and socio-economic conditions is the oft-mentioned bane of economic improvement in developing countries. The green building movement is essentially a component of economic development as it develops infrastructure that is critical for the structural transformations that characterise the process and outcome of economic development. As developing countries strive to change their present conditions, they have to overcome these deficits. Already, there are some developing and middle-income countries constantly on the global radar in terms of their green credentials. These include Brazil, China, India, South Korea and South Africa.

The third and final component of political will is political *must*. This component derives from the added pressure of compelling forces that force a desire to move beyond rhetoric to tangible action. The reason includes po-

This volume has signposted a number of issues and practices that can address the aforementioned challenges and accentuate some of the possible solutions presented. These issues and practices are important to inform changes that will ensure that as the magnitude and nature of the built environment transform, it leaves nothing behind. The year 2030 will be here soon. The taste of the construction industry's pudding will be in its eating when that year arrives. Until then, let green building be a way of life for everyone.

NOTES AND REFERENCES

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