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IMPLEMENTATION CHALLENGES OF SUSTAINABLE PRACTICES: A THEORETICAL EVALUATION ON A COUNTRY'S CONSTRUCTION INDUSTRY

BACCUS COOPER, MOLUSIWA RAMABODU, and NOKULUNGA MASHWAMA

Dept of Construction Management and Quantity Surveying, University of Johannesburg, Johannesburg, South Africa

Recent years have seen many challenges associated with sustainable construction practices, which stem mainly from the need to maintain a balance between the different dimensions of sustainability, including economic, social, and environmental. As a result, the paper investigates previous literature on the challenges of implementing sustainable practices in the South African construction industry. The data for this paper came from a systematic literature review, which included references to published theoretical literature. According to literature findings, one of the major challenges in sustainability implementation is capital cost, which is followed by information gathering, a lack of legislative incentives, leadership/management barriers, the challenges of chronic labor shortages, a lack of innovation and adaptability among industry stakeholders, and the industry's overall resistance to change. The study is primarily a literature review on the challenges of implementing sustainable practices as well as contributing innovative strategies to the thinking on sustainability in the South African construction industry. It is recommended that the construction industry be robust, have an attitude shift in finding practical solutions to tackle sustainable construction barriers, and develop standards and training objectives to ensure that the construction processes undertaken by various construction firms result in higher levels of education and environmental awareness.

Keywords: Environmental, Social, Recycle, Economic, Renewable.

1 INTRODUCTION

The term "sustainability" has been one of the most discussed in the last decade, despite the fact that it is poorly understood and has multiple interpretations. However, for many public and private sector players who take the following issue seriously, sustainability is associated with the process of embracing the environment and focusing on its long-term sustainability as a matter of concern for all humanity (Kibert 2013). In addition, the construction industry is a significant polluter (Shen and Tam 2002). Morelli (2011) estimates that a construction site generates 30% of the total weight of building materials delivered to the site. This has made it even more critical that whatever is built be built on the basis of sustainability, taking into account all aspects such as the environment, the economy, and society (Patil and Patil 2017). Many studies have demonstrated that projects based on sustainable construction can provide users with a comfortable and healthy living and working environment (Adamuščin *et al.* 2014). As a result, there has been a need for the sector to adopt more sustainable approaches that can significantly contribute to certain criteria such as energy efficiency, emission reduction, noise reduction, better indoor air quality, waste generation, and

pollution reduction. These are some of the common parameters for mitigating the challenges and achieving sustainability (Kibert 2013). Despite various plans and efforts, there are still several challenges that have been identified as factors controlling and influencing the performance, growth, and development of the South African construction industry, such as complexities associated with sustainable constructional practices, incompatible legislation and environmental laws, and a lack of innovation and adaptability among industry stakeholders (Oke *et al.* 2016). Against this backdrop, the purpose of this study is to conduct a literature review in order to investigate the implementation challenges of sustainable practices in South Africa.

2 RESEARCH METHODOLOGY

The research was based on a thorough review of existing published theoretical literature. The data was gathered by analyzing secondary literature and conducting empirical reviews in order to shed light on the challenges of implementing sustainable practices in the South African construction industry. In addition, the study relied on conference papers, articles, dissertation proceedings, and journals. A qualitative research method was used in this study.

3 CONSTRUCTION INDUSTRY IN SOUTH AFRICA

The construction industry in South Africa has been a major contributor to the country's economy (Plascon 2011). The industry is critical in providing the superior infrastructure necessary for economic growth and development as well as improving the general well-being of its citizens, resulting in job opportunities for skilled, semi-skilled, and unskilled workers (Dithebe 2018). However, the sector has been facing challenges in terms of economics, a lack of feasible working conditions, health, safety, sustainability, and operational performance, to name a few risk concerns highlighted for the South African construction industry (Aghimien *et al.* 2019). According to the findings of Aigbavboa *et al.* (2017), there is widespread ignorance and unawareness regarding the benefits of sustainability among industry stakeholders. Cost involvement in the process is also a challenge because both industry stakeholders and the general public believe that transitioning to sustainability would just add more expenses to construction projects. Furthermore, there is a widespread belief that building cost overruns exacerbate the situation. According to Aghimien *et al*. (2019), the main issue impeding the application of sustainable practices in the South African construction industry is a lack of desire among construction professionals. Furthermore, industry stakeholders are resistant to change and are hesitant to transition from conventional construction processes to sustainable measures.

4 SUSTAINABLE CONSTRUCTION IN SOUTH AFRICA

For a long time, there was little public understanding of the importance of sustainability in construction techniques in South Africa. Nonetheless, beginning in the 2000s, the country's awareness of the dangers of global climate change increased, and it influence was felt in the construction industry as well (Windapo and Cattell 2013). The Green Building Council of South Africa was established in 2007, following in the footsteps of the Green Building Council of Australia. The Council developed Green Star SA rating tools to recognize and award sustainable construction across the country, as well as to make commercial property more environmentally friendly (Oguntona *et al.* 2019). Low-income housing has been built with the assistance of the Department of Housing and the National Home Builders Registration Council. Houses built under this concept are equipped with energy-saving features such as modest pre-paid electricity units and insulated ceilings (Azimoh *et al.* 2015). Other trends in sustainable constructional processes that

South Africa hopes to implement in the near future to achieve energy efficiency in the construction industry include rainwater recovery and conservation, carbon neutrality, and skyfarming to improve global food security through innovative farming within housing construction (Hong *et al.* 2015, Sehnem 2016). South Africa also has a strong policy in place to ensure that sustainability is maintained throughout its supply chain. The material purchase methods closely adhere to the protocols outlined in South African Technical Standard (SATS) 1286 of 2013 (Patil and Patil 2017). Standards are also developed, and training targets are established, to ensure that the construction processes undertaken by various construction firms result in higher levels of education and environmental awareness (Sehnem 2016, Patil and Patil 2017).

5 CHALLENGES IN IMPLEMENTING SUSTAINABLE PRACTICES

The construction industry has for a long time been driven by financial concerns, which have often prevented the industry from adopting environmentally friendly practices and solutions. Also, the construction companies have been using techniques that have been evolved over a long time and are now reluctant to change their tried and tested ways, specifically given the fact that they have contributed to maximizing their profits (Kibert 2013). Within this context, the present section will provide some common challenges present while opting for sustainable construction.

5.1 Capital Cost

It is a widespread perception that sustainable buildings are generally higher in cost than the market will be ready to pay for them (Mjakuškina 2019). This is majorly due to factors such as lack of accurate, thorough, and quantifiable information about the financial and economic impact, as well as an understanding of the true cost and benefits of these high-performance buildings, which is also a major challenge in the implementation of sustainable practices (Morelli 2011).

5.2 Information Gathering

There is still a research gap in the subject of green building. As a result, it cannot be correctly determined if the green costs are affordable and whether the technology utilized in the process is reliable or not. All of this raises the question of whether the structure so constructed will become obsolete sooner than conventional buildings due to the complexity involved (Mjakuškina 2019). Furthermore, there has been a lack of agreement on the understanding of sustainable building, minimum performance standards, and activities that are more environmentally friendly. As a result, the inability to integrate and efficiently disseminate the large amount of information available is a major concern (Kibert 2013).

5.3 Lack of Legislative Initiatives

According to Abidin and Powmya (2014), a lack of legislative initiative also offers a challenge to the process. Local regulations are critical in influencing organizations and people to construct innovative, sustainable construction. On the other hand, the lack of local regulation discourages domestic and international parties from engaging in such activities (Ametepey *et al.* 2015).

5.4 Leadership/Management Barrier

Opoku and Fortune (2011) suggest that lack of leadership can also pose a challenge to the adoption of innovative sustainable practices. Lack of motivation from managers or miscommunication of the aspiration values leads to delays in decision making, which act as a barrier to the process. Leadership in the construction industry plays a major role in the development and implementation

of resources required for innovative practices (Dithebe 2018).

5.5 Challenge of Chronic Labor Shortage

Because construction is a labor-intensive industry, the availability of productive and skilled labor is a critical factor. Lack of training, required skills, knowledge, and skill mismatch all pose challenges to innovative and sustainable practices (Dithebe 2018). There is also a scarcity of vocation training and technical education facilities to prepare people.

5.6 Awareness of Stakeholders

The lack of awareness among stakeholders prevents the growth, adoption, and implementation of such innovative practices (Alsanad 2015). Furthermore, in order to implement sustainable practices in the construction industry, stakeholders' perspectives on the industrial framework must shift. A cyclical approach involving the life cycle of construction materials must be developed. They must consider the phases of planning, design, construction, waste management, and reuse (Saleh and Alalouch 2015).

6 LESSON LEARNT

Ensuring long-term construction sustainability is a challenging task. Financial costs, a lack of awareness among industry stakeholders, a lack of innovation and adaptability among industry stakeholders, low demand among customers for sustainable construction processes and projects, natural resource depletion, incompatible legislation and environmental laws, and the entire industry's resistance to change are some of the common factors that create a challenging working environment and threaten the construction industry's sustainability in South Africa. However, despite the challenges in the South African construction industry, the primary benefits of implementing sustainability in the construction industry include reducing greenhouse emissions, minimizing air pollution, improving population health, and reducing overuse and wasteful use of energy resources.

The construction industry is responsible for massive environmental damage through processes such as waste generation, energy utilization, water depletion, and so on. Energy conservation, material conservation, and water conservation, on the other hand, have been identified as potential innovative practices or strategies that can be implemented in the construction sector to help mitigate challenges and turn the tide on poor sustainability practices.

Energy Conservation: The main goal here should be to reduce fossil fuel consumption and increase renewable energy consumption by selecting materials and construction methods that have low embodied energy and can assist construction companies in reducing energy consumption during processes such as mining, processing, manufacturing, and material transportation.

Material Conservation: Many construction minerals are non-renewable. As a result, during the planning and design phases, it is necessary to reduce the use of both renewable and nonrenewable resources. The focus is primarily on strategies for improving material efficiency and reducing waste generation, both of which help to significantly reduce the use of nonrenewable resources. Reintroducing construction materials into the manufacturing process can undeniably help to reduce the overall environmental impact by adhering to three key waste reduction principles: reducing, reusing, and recycling, as well as proper construction waste disposal.

Water Conservation: Building operations use a significant amount of water, accounting for a significant portion of total consumption. In addition, water is used extensively in the extraction, production, manufacturing, and on-site construction processes. Water conservation technologies,

on the other hand, continue to be the most underappreciated aspect of the entire construction process. Using water-saving plumbing materials, such as recycled water for toilet flushing or a gray water system that collects rainwater, and installing an underground drip irrigation system, which reduces evaporation loss, can also help to improve water efficiency.

Some of the key drivers that can provide a boost to the practice of sustainability and the construction industry include more finance for the sector, education and training on green construction, improved government support and intervention, and improvement in multi-disciplinary collaboration between construction industry stakeholders. However, the sector will only be able to achieve this if all stakeholders support and collaborate in the implementation of sustainable practices.

7 CONCLUSION

The current study examined the literature on the challenges associated with implementing sustainable construction practices. Following that, it was discovered that there are several barriers/challenges to implementing sustainable construction, such as capital cost, information gathering, design and construction barriers, stakeholder awareness, and a lack of legislative incentives. As a result, the study recommends that stakeholders benefit from sustainable construction by saving energy, conserving water, and materials, as well as saving capital, increasing return on investment, increasing overall productivity, and using resources more efficiently and effectively. Furthermore, developing a capable and viable construction sector capable of responding to sustainable development demands could potentially assist the construction sector in embarking on a path of sustainable development. Although similar literature review papers and research have already been conducted on this topic, research on the implementation challenges of sustainable practices in South Africa is required because, at this time, sustainability has become an accepted example in the industry due to the growing concern about the serious negative impact of human activities on the environment. Future research can concentrate on analyzing the challenges posed by high capital costs and performance material requirements in promoting sustainable construction.

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