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CARBON TAX ACT EFFECT ON THE BUILT ENVIRONMENT: LESSONS FROM SOUTH AFRICA

J. Petersen[1], O. Akinradewo[1*] and C. Amoah[1]

[1] Department of Quantity Surveying & Construction Management, University of the Free State, Bloemfontein, South Africa
opeakinradewo@gmail.com

ABSTRACT: The Carbon Tax Act, enacted in South Africa in 2019, seeks to address climate change by reducing greenhouse gas emissions through taxation on carbon-intensive activities. As a major contributor to global carbon emissions, the built environment faces significant challenges in adapting to this legislation. Despite its potential to drive sustainability, limited awareness and preparedness among stakeholders pose barriers to its effective implementation. This study aims to evaluate the perceived impacts of the Carbon Tax Act on the built environment, focusing on financial implications, awareness levels, mitigation strategies, and long-term sectoral effects. A qualitative research methodology was adopted to explore these perceptions. The target population comprised built environment professionals, including architects, engineers, project managers, and quantity surveyors. Using a purposive sampling technique, 41 respondents were selected to ensure representation of diverse perspectives within the sector. Data were collected through structured interviews facilitated online, employing open-ended questions to elicit detailed responses. Thematic analysis was used to analyse the data, uncovering key patterns and insights. Findings indicate that most respondents (51%) believe clients should bear the financial burden of the tax, while 90% highlighted insufficient awareness within the sector. Most participants (83%) anticipated adverse economic impacts, citing increased material and compliance costs. The study concludes that while the Act presents challenges, it offers opportunities for systemic change. Recommendations include enhancing stakeholder awareness, incentivizing sustainable practices, and developing clear cost-allocation frameworks priorities.

1. INTRODUCTION

The built environment is one of the largest contributors to global carbon dioxide emissions. These emissions stem from various sources, including the production of conventional building materials, physical construction processes, and the lifecycle operations of buildings (Adams et al., 2019). Recognizing this, the industry has seen green building and sustainable design principles emerge to reduce carbon footprints from inception to occupation (Kubba, 2017). The urgency to adopt these approaches has been amplified by the enactment of the Carbon Tax Act in South Africa, effective from 1 June 2019 (Department of National Treasury, 2019).

Before implementing the Carbon Tax Act, speculations and projections emerged to address knowledge gaps created by the carbon tax system. Many industries, particularly fossil fuel-reliant sectors such as electricity generation and the built environment, began to assess the potential impacts (Alton et al., 2014). However, limited research on the cost implications for the built environment, particularly regarding

conventional building materials, construction phases, and lifecycle costs, leaves critical questions unanswered.

A report by the World Green Building Council (2019) highlights that buildings and construction account for 39% of global carbon emissions. These emissions can be categorized into operational emissions, which account for 28% and arise from heating, cooling, and lighting, and embodied emissions, which stem from the construction processes and materials used throughout a building's lifecycle (Mohammed et al., 2013; Adams et al., 2019). The goal, therefore, is to design and construct buildings with minimal environmental impact, aligning with the ideals of green building and sustainable design. According to Kibert (2005), green buildings are resource-efficient facilities that promote environmental health.

Intervention mechanisms are increasingly recognized as essential for mitigating the built environment's impact on climate change. Among these, the Kyoto Protocol stands out as a pivotal international agreement, urging member states to reduce greenhouse gas emissions through policies and taxes (United Nations Framework Convention on Climate Change, 2005). One such policy instrument is the green tax, also called environmental, ecotaxes, or pollution taxes, designed to reduce carbon dioxide emissions, waste, and other pollutants (Xu, 2010).

Within the category of green taxes, carbon taxes are specifically aimed at addressing greenhouse gas emissions (Braathen, 2011). Carbon taxes function as economic instruments, contrasting with the cap-and-trade system, another market-based mechanism. The cap-and-trade model imposes a limit or “cap” on allowable emissions and allows companies to trade unused allowances, incentivizing lower emissions (Lee et al., 2011). Research suggests that implementing both carbon taxes and cap-and-trade systems together may provide a more effective and timely solution for reducing emissions. However, their feasibility is influenced by regional and governmental policies (Weber, 2011).

Despite extensive research into carbon mitigation strategies, knowledge gaps persist regarding the Carbon Tax Act's specific financial and operational impacts on South Africa's built environment. This paper explores these effects, focusing on building costs, long-term sustainability, and the sector's adaptation to the policy.

2. CARBON TAX IN THE BUILT ENVIRONMENT

The growing impact of the built environment on climate change necessitates the adoption of effective intervention mechanisms. The Kyoto Protocol stands out as a pivotal international agreement aimed at stabilizing greenhouse gas emissions through binding commitments for member states to reduce atmospheric carbon dioxide (United Nations Framework Convention on Climate Change, 2005). taxes have gained prominence among the various mitigation instruments developed in response. These taxes, also referred to as environmental or pollution taxes, are designed to reduce emissions and waste by financially incentivizing sustainable practices (Xu, 2010). Green taxes can target emissions, users of emission-producing facilities, or goods and services at different stages of production and consumption (Weber, 2011). Similarly, carbon taxes are categorized as economic instruments that directly address greenhouse gas emissions. The cap-and-trade system, another significant mechanism, operates by capping allowable emissions and enabling companies to trade unused allowances, providing flexibility while promoting overall emission reductions (Lee et al., 2011). Research suggests combining carbon taxes with cap-and-trade systems could yield more effective results, though their implementation depends heavily on regional and national regulatory frameworks (Weber, 2011).

In South Africa, the Carbon Tax Act represents a bold step in the country’s environmental strategy, targeting emissions reductions in one of the world’s most carbon-intensive economies due to its reliance on coal (Ampofo-Anti et al., 2015; South African Government, 2019). While the tax aims to drive structural transformation, concerns about its economic implications persist. Stakeholders, including labour unions, civil society groups, and industry representatives, have expressed fears over potential job losses, rising energy prices, and decreased export competitiveness (Alton et al., 2014). Despite resistance, the Act has fostered critical national dialogue on climate change, encouraging all stakeholders to reconsider their roles in reducing emissions (Szabo, 2019). This dialogue signifies a key shift toward embedding sustainability within South Africa’s economic and environmental policies.

3. RESEARCH METHODOLOGY

This study employed a qualitative research approach to explore the perceptions of built environment professionals regarding the financial implications of the Carbon Tax Act on South Africa's construction industry. Qualitative research seeks to understand complex phenomena through subjective insights, allowing in-depth exploration of participants' views and experiences (Naoum, 2019). Five open-ended questions were designed to elicit responses in an exploratory manner, focusing on key themes such as building costs, adaptation to the Act, and long-term sustainability. These questions were carefully crafted using "Who" and "Why" prompts to encourage respondents to share detailed opinions and provide rich, nuanced data about their experiences and expectations. The interview format allowed for flexibility, enabling follow-up questions to clarify or expand upon participants' insights, consistent with qualitative research methodologies (Bryman, 1988).

Respondents were selected from a target population defined by the Council for the Built Environment Act 43 of 2000, which categorizes professionals in architecture, engineering, project and construction management, property valuation, quantity surveying, and related roles. A purposive sampling strategy was adopted to ensure the inclusion of individuals with relevant expertise and experience. Interviews were conducted online via Teams and recorded to avoid misrepresenting the respondent's opinion. Ethical considerations were integral to the study design; participants were provided with an information leaflet detailing the research purpose, confidentiality assurances, and the voluntary nature of participation. Informed consent was obtained from all respondents before data collection commenced, adhering to ethical protocols outlined by Dooly et al. (2017) and Wiles (2013). Retrieved data was analysed using content analysis to extract themes from the responses. A thematic coding analysis was applied to group the different ideas that emerged from the responses for each question. These themes will be presented and analysed separately as each question allows the respondents to express their thoughts on the specific question.

4. FINDINGS AND DISCUSSION

A descriptive analysis was carried out based on the 11 interviewees adopted for this study. Demographically, the participants' years of experience were well-distributed, with 39% each having 3 to 5 years and more than 10 years of experience and 22% between 5 to 10 years. Professionally, Quantity Surveyors made up 39% of respondents, followed by Construction and Project Managers (29%), Engineers (15%), and Architects (12%). Additionally, a small fraction (5%) included roles like Asset Finance and Construction Admin Support, aligning with the study's inclusive approach to defining professionals in the built environment.

4.1 Question 1 – Who should be responsible for bearing the cost of the Carbon Tax?

The question of who should bear the financial burden of the Carbon Tax Act elicited diverse and thought-provoking responses, reflecting varying perspectives on accountability within the built environment. Most respondents (51%) believed that the responsibility should lie with the clients of construction projects. This view aligns with the role of clients as key drivers of demand for sustainable practices, as they typically control project financing and decision-making (Kubba, 2017). Clients' financial influence uniquely positions them to set sustainability priorities, including provisions for carbon-related costs during construction projects' planning and budgeting phases. Interestingly, 17% of respondents pointed to the "polluter" as the party responsible for the carbon tax, highlighting adherence to the polluter pays principle. This principle, as discussed by Braathen (2011), holds that those who generate pollution should internalize the costs of mitigating its impact. This could include manufacturers of high-carbon materials or entities engaging in carbon-intensive construction processes within the built environment. Such an approach incentivizes polluters to adopt cleaner production methods and align their operations with the broader environmental sustainability goals (Lee et al., 2011).

A notable 15% of respondents advocated for shared responsibility among stakeholders, emphasizing the collective nature of the environmental challenge posed by carbon emissions. This perspective supports a collaborative approach where clients, contractors, manufacturers, and even policymakers contribute to

mitigating carbon emissions. Shared responsibility models could lead to innovative partnerships, such as shared investments in low-carbon technologies or joint efforts to meet carbon reduction targets (Adams, Burrows & Richardson, 2019). However, implementing such models requires clear regulatory frameworks and cooperative agreements among stakeholders to avoid disputes over cost allocation. Interestingly, only 5% of respondents assigned responsibility to contractors. This minimal attribution may stem from contractors' intermediary role in construction, where they execute projects based on clients' specifications. As Spiegel and Meadows (2005) suggested, contractors typically operate within clients' financial and material constraints, limiting their autonomy in absorbing or passing on carbon-related costs. Furthermore, 2% of respondents proposed that "no one" should bear the carbon tax cost. This sentiment may reflect scepticism about its efficacy or concerns over its impact on project affordability (Alton et al., 2014).

These findings underscore the need for clearer guidelines on cost allocation within the framework of the Carbon Tax Act. Transparent policies can reduce ambiguity and ensure financial responsibilities are distributed equitably across the construction value chain. Additionally, policymakers and industry leaders could explore mechanisms such as tax incentives or subsidies to ease the financial burden on stakeholders while encouraging sustainable practices. As Klimenko, Mikushina, and Tereshin (2016) noted, balanced regulatory frameworks can drive environmental objectives without disproportionately burdening any group.

4.2 Question 2 – Is the built environment adequately informed to respond to implementing the Carbon Tax Act?

A critical finding of this study is the significant lack of awareness among professionals in the built environment regarding the Carbon Tax Act and associated mitigation measures. An overwhelming 90% of respondents expressed concerns that the sector is inadequately informed about the Act and its implications. This aligns with findings from Ampofo-Anti, Dumani, and van Wyk (2015), who identified insufficient dissemination of environmental policies as a persistent barrier to their practical implementation in the construction industry. Such limited awareness undermines the sector's ability to adapt to regulatory changes proactively, further emphasizing the importance of fostering a robust understanding of the Act's objectives, scope, and application. The lack of awareness has profound implications for the sector, as it limits the industry's ability to develop and implement strategies that align with the Act's requirements. Research by Adams, Burrows, and Richardson (2019) underscores the importance of equipping stakeholders with the knowledge and tools to reduce embodied carbon and operational emissions in construction. Without adequate awareness, professionals may miss opportunities to integrate sustainable practices into project planning and execution, resulting in non-compliance and potential financial penalties. Moreover, the lack of understanding could exacerbate resistance to the Act, with stakeholders perceiving it as an additional financial burden rather than an opportunity to transition toward more sustainable practices (Braathen, 2011).

This knowledge gap also reflects broader systemic challenges in disseminating policy information within the built environment. As Klimenko et al. (2016) note, effective policy implementation requires comprehensive stakeholder engagement and communication strategies., Targeted educational initiatives and capacity-building programs are urgently needed to bridge this gap. These initiatives could include workshops, industry seminars, and digital platforms that disseminate key information about the Act, its implications, and practical mitigation measures. Additionally, collaboration between government bodies, industry associations, and academic institutions could enhance the reach and effectiveness of these programs, ensuring that professionals across the sector are adequately prepared to meet regulatory demands. Enhanced awareness could foster a broader adoption of sustainable practices, including integrating low-carbon technologies and lifecycle carbon assessments. As highlighted by Kubba (2017), increased knowledge and understanding empower stakeholders to make informed decisions, facilitating the transition to greener practices. Furthermore, raising awareness can promote a shift in mindset within the industry, where sustainability becomes a core priority rather than a compliance-driven obligation. This paradigm shift is essential for achieving the long-term environmental objectives outlined in the Carbon Tax Act and other related policies.

4.3 Question 3 – Do you think applying a Carbon Tax will adversely affect building costs?

The financial implications of the Carbon Tax Act were a central concern for respondents, with 83% anticipating an adverse impact on building costs. The primary concerns raised included increased input costs for materials, higher compliance expenses, and overall escalation of construction costs. This sentiment aligns with the findings of Alton et al. (2014), who observed that carbon taxation imposes significant cost pressures on energy-intensive sectors in South Africa, including construction. The built environment relies heavily on carbon-intensive processes and materials, such as cement, steel, and glass, which are directly affected by carbon tax levies. Consequently, these increased costs are often passed along the value chain, potentially inflating the final costs of construction projects. The minority of respondents (17%) who believed the impact would be minimal pointed to the limited scope of the tax, which primarily targets specific materials and activities. This perspective underscores the importance of understanding the Carbon Tax Act's detailed provisions, including its exemptions, thresholds, and tax-free allowances (Department of National Treasury, 2019). These allowances, such as those granted for trade-exposed industries, may mitigate the financial burden for specific stakeholders, thereby reducing the overall impact on construction costs. However, the relative unawareness of these provisions among professionals, as highlighted in this study, could explain the predominantly negative perceptions of the Act's financial implications.

The anticipated cost increases have broader implications for the affordability and feasibility of construction projects. High input costs may deter investment in new developments or lead to budget overruns in ongoing projects, impacting developers and end-users. As Kibert (2005) noted, financial constraints are a significant barrier to adopting sustainable building practices, and the Carbon Tax Act could inadvertently exacerbate this challenge if not accompanied by supportive measures. Policymakers and industry leaders must address this issue by exploring mechanisms such as subsidies, tax rebates, or financial incentives to offset the additional costs imposed by the Act. Moreover, the findings reveal a pressing need for further empirical research to comprehensively quantify the financial impact of the Carbon Tax Act on the construction value chain. Such studies could examine the tax’s direct and indirect effects on material costs, labour expenses, and project budgets. Insights from these studies would provide valuable data to inform policy adjustments, ensuring that the tax achieves its environmental objectives without stifling growth in the built environment. As Adams et al. (2019) emphasize, balancing environmental sustainability with economic viability is critical to fostering widespread acceptance and compliance with carbon reduction policies.

The divergent views among respondents also highlight the need for targeted education and capacity building to improve understanding of the Act’s provisions. Raising awareness about the scope of the tax, its exemptions, and the availability of alternative low-carbon materials could help mitigate negative perceptions and encourage proactive adaptation. As Spiegel and Meadows (2005) suggest, industry stakeholders must have the knowledge and tools to integrate sustainable practices into their operations, reducing dependency on carbon-intensive materials and processes over time. Such efforts could transform the Carbon Tax Act from being perceived as a financial burden to a catalyst for innovation and sustainability in the construction sector.

4.4 Question 4 - Are you aware of other mitigation mechanisms to curb greenhouse gas emissions by the built environment?

The study findings reveal a significant gap in awareness of alternative greenhouse gas mitigation strategies within the built environment, with only 37% of respondents identifying viable options. These options included incorporating recycled materials, adopting green building designs, and reusing construction waste—widely recognized as essential components of sustainable construction (Kibert, 2005). While these strategies align with the principles of reducing embodied and operational carbon emissions, the limited awareness highlights a broader systemic issue: the sector’s insufficient readiness to embrace low-carbon practices comprehensively. The identified mitigation mechanisms, such as using recycled materials and reusing construction waste, are critical to reducing the environmental impact of construction projects. For instance, Spiegel and Meadows (2005) emphasize that selecting green building materials not only minimizes waste but also reduces the carbon footprint associated with material production and transportation. Similarly, green building design integrates energy efficiency, resource optimization, and environmental responsiveness, reducing operational emissions throughout a building's lifecycle (Kubba, 2017). As

reflected in the study responses, these practices form the backbone of sustainable construction, yet their adoption remains limited.

The lack of broader knowledge about alternative mitigation mechanisms highlights a critical need for targeted advocacy and capacity-building initiatives. The World Green Building Council (2019) notes that increasing awareness and education about green building certifications, such as LEED and EDGE, can be pivotal in encouraging sustainable practices. These certifications provide frameworks and benchmarks for implementing low-carbon strategies, enabling stakeholders to quantify their environmental impact and achieve measurable reductions. Advocacy efforts should also emphasize the financial and operational benefits of sustainable construction, such as reduced energy costs and enhanced building performance, to incentivize widespread adoption. Furthermore, incentivizing innovation and research into sustainable technologies is essential for bridging the knowledge gap and fostering readiness for low-carbon transitions. Governmental and industry-led initiatives, such as tax credits, grants, or subsidies for sustainable practices, could accelerate the adoption of alternative mitigation mechanisms. As noted by Adams et al. (2019), such incentives can lower the barriers to entry for green technologies and encourage investment in research and development. For example, advancements in carbon capture and storage technologies or innovative materials like cross-laminated timber could significantly reduce the sector's carbon footprint when integrated into mainstream construction practices.

The findings also suggest that a lack of awareness may hinder the built environment's ability to comply with carbon reduction policies, including the Carbon Tax Act. Without a clear understanding of available alternatives, stakeholders may struggle to meet regulatory requirements, leading to non-compliance or increased costs. To address this, collaborative efforts between policymakers, industry leaders, and academic institutions are needed to develop comprehensive training programs and workshops. These initiatives should focus on equipping professionals with practical knowledge and skills for implementing mitigation strategies, as well as fostering a culture of innovation and sustainability within the sector (Braathen, 2011).

Finally, integrating lifecycle carbon assessments into construction practices could further enhance awareness and adoption of mitigation mechanisms. By assessing the total carbon emissions of a building from production to demolition, stakeholders can identify areas for improvement and prioritize sustainable practices throughout the construction process (Mohammed et al., 2013). As Klimenko et al. (2016) argued, a lifecycle approach to carbon management is essential for achieving long-term environmental sustainability and aligning with global climate objectives. Encouraging lifecycle assessment tools, supported by digital platforms and data-sharing initiatives, could enable the sector to make informed decisions and adopt alternative mitigation mechanisms more effectively.

4.5 Question 5 - Should the built environment be concerned about the Carbon Tax Act's long-term effects on the sector?

The long-term implications of the Carbon Tax Act revealed a spectrum of opinions among respondents, reflecting the complexities of its potential impact on the built environment. While 29% of respondents expressed optimism about its minimal effect and potential benefits, the majority (71%) voiced significant concerns, particularly regarding the Act's financial burden on construction costs. These concerns align with Ampofo-Anti et al. (2015) findings, which highlighted the challenges of integrating environmental policies into cost-sensitive sectors like construction. The Act's direct and indirect costs—from higher material prices, compliance requirements, and increased project budgets—pose substantial challenges, particularly for stakeholders operating on tight financial margins. Despite these concerns, some respondents acknowledged the Carbon Tax Act as a potential driver for systemic change within the built environment. By incentivizing a transition toward sustainable construction practices, the Act can accelerate the adoption of green building designs, low-carbon technologies, and whole-life carbon assessments. These practices are essential for reducing the environmental footprint of construction projects and ensuring long-term sustainability. As Klimenko, Mikushina, and Tereshin (2016) argue, regulatory frameworks like the Carbon Tax Act can serve as catalysts for significant environmental improvements when supported by well-designed mechanisms that balance economic and ecological priorities.

The potential for long-term sustainability hinges on stakeholders' willingness and ability to adapt to the Act's requirements. Whole-life carbon assessments, for example, provide a comprehensive framework for evaluating emissions across a building's lifecycle—from material production to demolition (Mohammed et al., 2013). Implementing these assessments could help stakeholders comply with the Act and identify opportunities to optimize resource use and reduce operational emissions. Such approaches align with the principles of sustainable construction outlined by Kibert (2005), emphasizing resource efficiency and environmental responsibility. However, achieving these benefits requires robust support mechanisms to mitigate the financial impact and facilitate the transition to sustainable practices. Incentives such as tax rebates, subsidies, and grants for adopting low-carbon technologies could alleviate the financial burden on stakeholders and encourage compliance. For example, the government could subsidize environmentally friendly materials or offer tax credits to projects that achieve green building certifications like LEED or EDGE (World Green Building Council, 2019). Additionally, capacity-building initiatives, including training programs and knowledge-sharing platforms, can empower professionals with the skills and tools to implement sustainable practices effectively.

The mixed responses also underscore the importance of aligning policy frameworks with industry realities. As Braathen (2011) points out, the success of carbon-related taxation depends on its design and integration into the broader policy environment. Policymakers must consider the construction sector's unique challenges, such as cost sensitivity, fragmented supply chains, and limited awareness of sustainable practices. A more comprehensive approach could involve integrating the Carbon Tax Act with complementary mechanisms such as cap-and-trade systems, which, when used in tandem, have been shown to create a more flexible and economically efficient pathway for emissions reductions (Lee et al., 2011; Weber, 2011). While the Carbon Tax places a fixed price on emissions, cap-and-trade allows for market-driven adjustments, and together, these tools could form a hybrid model tailored to South Africa's developmental and environmental objectives.

Moreover, aligning South Africa's domestic carbon pricing instruments with global frameworks such as the Paris Agreement and Sustainable Development Goal 13 (Climate Action) would enhance policy coherence and reinforce the country's international commitments. As Klimenko, Mikushina, and Tereshin (2016) argue, coordinated policy responses that integrate local action with global goals are crucial for achieving long-term climate resilience. Collaborative efforts involving government, industry associations, and academic institutions are essential for addressing these challenges and ensuring that the Carbon Tax Act delivers its intended environmental benefits without stifling industry growth. Finally, the Act's potential to drive long-term sustainability will depend on fostering a cultural shift within the built environment. Encouraging a mindset prioritising sustainability over short-term cost considerations is critical for achieving lasting change. As Adams, Burrows, and Richardson (2019) note, a proactive approach to sustainability can position the construction sector as a leader in combating climate change, enhancing its resilience and competitiveness in a carbon-constrained future.

5. IMPLICATION OF FINDINGS

The findings of this study highlight critical implications for the built environment in South Africa, particularly regarding the implementation and impact of the Carbon Tax Act. The overwhelming lack of awareness among stakeholders underscores the need for comprehensive educational initiatives and capacity-building programs to equip professionals with the knowledge and tools necessary for compliance. Additionally, the financial burden of the Act, as perceived by most respondents, reveals potential challenges in project affordability and market competitiveness, emphasizing the importance of financial support mechanisms such as subsidies, tax rebates, and grants. The limited awareness of alternative mitigation strategies also points to a missed opportunity for the sector to adopt sustainable practices that align with global climate objectives. Furthermore, the mixed responses on long-term implications suggest that while the Act holds promise as a driver of sustainability, its success depends on the availability of clear guidelines, equitable cost allocation frameworks, and collaborative efforts among stakeholders. These findings imply that without strategic interventions and robust policy support, the Carbon Tax Act may exacerbate financial pressures in the sector rather than catalyse the systemic change needed to achieve meaningful carbon reductions.

6. CONCLUSION AND RECOMMENDATIONS

This study examined the Carbon Tax Act and its perceived effects on South Africa's built environment, focusing on responsibility for bearing the cost, awareness levels, financial implications, alternative mitigation mechanisms, and long-term sectoral impacts. The findings underscore the multifaceted challenges and opportunities presented by the Act. Most respondents believed that the financial responsibility for the Carbon Tax should primarily fall on clients, highlighting their influential role in driving sustainable practices. However, varying perspectives, including shared responsibility among stakeholders and adherence to the "polluter pays" principle, reflect the complexity of cost allocation in the construction sector. Additionally, an overwhelming lack of awareness regarding the Act and its mitigation measures emerged as a critical barrier to effective implementation, emphasizing the need for improved communication and education.

The study also highlighted concerns about the Act's financial burden on construction costs, with most respondents anticipating significant adverse effects. Despite these challenges, the Act was recognized as a potential catalyst for transitioning toward sustainable practices, including green building designs, lifecycle carbon assessments, and innovative low-carbon technologies. However, limited awareness of alternative mitigation strategies further revealed the sector's unpreparedness to adapt fully to the Act's provisions. The long-term implications of the Carbon Tax Act elicited mixed reactions. While some viewed it as a beneficial regulatory framework that could drive sustainability, the majority expressed apprehension about its financial implications and their potential to deter investment. These findings reinforce the importance of aligning the Act with practical support mechanisms to balance its environmental objectives with economic realities.

Several recommendations are proposed to address the challenges identified in this study and maximize the potential benefits of the Carbon Tax Act. First, enhancing awareness and education is critical. Targeted initiatives, such as workshops, industry seminars, and digital platforms, should be launched to improve stakeholders' understanding of the Act, its objectives, and its implementation. These programs would help bridge the knowledge gap and empower professionals to align their practices with the legislation's requirements. Second, introducing financial incentives and support mechanisms, such as subsidies, tax rebates, and grants, could alleviate the financial burden of adopting low-carbon technologies and sustainable materials. Equally important is the development of clearer guidelines on cost allocation. Establishing equitable frameworks for distributing the financial responsibility of the Carbon Tax among stakeholders would ensure fairness and transparency, reducing potential conflicts. Furthermore, increased investment in research and innovation is essential to advance the development of low-carbon technologies and materials, enabling the construction industry to minimize its environmental impact effectively. In addition, aligning the Carbon Tax Act with complementary policies and programs is vital to creating a cohesive regulatory environment that fosters sustainability in the built environment. Such alignment would help streamline compliance and encourage collaboration among stakeholders. Lastly, long-term strategic planning should be prioritized to encourage a cultural shift within the sector. Emphasizing sustainability and long-term environmental goals over short-term cost considerations will foster a proactive approach to climate action, ensuring the built environment plays a pivotal role in achieving South Africa's carbon reduction targets.

The study adopted only 11 professionals to retrieve their opinion on the carbon tax effect on the built environment in South Africa. Due to the small sample size, the study's findings cannot be generalised for the South African built environment. Hence, future studies can be carried out by sampling the opinion of professionals across the nine provinces of South Africa with more representation to validate the findings of this study.

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