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ASSESSMENT OF ENVIRONMENTAL SUSTAINABILITY COMPLIANCE (ESC) AND AWARENESS IN WORKS PROCUREMENT LEADING UNIVERSITIES IN GHANA

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ABSTRACT

Purpose: The study explored the level of compliance and integration of environmental sustainability (ES) considerations into the pre-contract stage of public works procurement in leading universities in Ghana and the extent to which awareness is spreading for the advancement of ES.

Design/methodology/approach: A qualitative method was adopted for data collection and analysis. Content analyses were carried out on public tender documents from leading Universities in Ghana, and the results were analysed and conclusions drawn.

Research Limitation: The study was limited to Ghana's first three leading Universities. It would have been more informative if it had covered all government institutions, including local institutions, across Ghana's sixteen (16) regions**.**

Findings: The findings suggest the overall level of ES compliance and integration into the evaluation process is currently low at 41%. However, the awareness of ES considerations in public works procurement is above average at 66%.

Practical implication: The study results inform policymakers, procurement practitioners, and other stakeholders of the low level of ESC and the average level of awareness during the tendering process of works procurement. This can serve as a basis for recommending effective ways of addressing challenges and thus ensuring meaningful compliance with ES, which will help achieve sustainable development goals (SDGs).

Social Implication: This insight can guide developing or adjusting regulations and incentives to promote more effective environmental practices.

Originality/Value: Despite the legislative amendments locally and the global focus on sustainability, research suggests that the integration of environmental sustainability into public works procurement practices remains limited. This is expected to set the pace for further research on addressing these challenges.

Keywords: *Compliance. environmental. sustainable development. sustainability. works procurement.*

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INTRODUCTION

Environmental sustainability is a critical aspect of sustainable development. It aims to achieve the resource and service needs of current and future generations while preserving the well-being of ecosystems (Morelli, 2011). Compliance with environmental sustainability (ES) involves adhering to laws, regulations, and standards to safeguard the environment (United Nations Environment Programme, 2022).

According to Rode et al. (2011), approximately 10% of the world's energy usage can be attributed to manufacturing materials for building construction. Furthermore, 40% of waste materials from advanced nations can be linked to construction and demolition activities. In comparison, 40% of the world's emissions responsible for global warming potentials (GWP) are directed towards the operation stage of construction products. Adjarko et al. (2016) also posit that nearly 17% of the global freshwater consumption, 25% of global logging and 40% of global energy flow and materials go into building construction (Ahmed, 2005).

While the Public Procurement Act, 2003 (Act663) was amended in 2016 in Ghana, mandating tenderers to possess the necessary environmental qualifications, it is essential to assess the compliance level of its integration in the evaluation of tenders in public works procurement since the law took effect. Ponte et al. (2020) stated that, despite the legislative changes and global focus on sustainability, the integration of environmental sustainability into public procurement processes remains limited. This was brought to the fore after his studies in Canada on integrating ES into public procurement requests for proposals (RFPs), which were found to be superficial, with limited consideration in the evaluation process. Similarly, a study in Ghana by Agbesi et al. (2020) revealed that when it comes to sustainability, application is limited for all the triple bottom aspects. In addition, existing research has primarily focused on sustainability at the construction and design phases, but limited attention has been paid to the sourcing and tendering stages (Goni et al., 2015). Lastly, despite the growing interest in sustainability, there remains a lack of information on Environmental Sustainability Compliance in public works procurement (Sönnichsen & Clement, 2020).

Exploring environmental sustainability compliance (ESC) in public works procurement can assist procurement practitioners in expanding their knowledge and integrating sustainable practices in compliance with global and local sustainability laws and regulations, including the amended Public Procurement Act, 2003 (Act 663). This will help achieve effective tender evaluation in light of ESC objectives in the construction industry.

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This amendment aligns with the goals outlined in the Voluntary National Review (VNR) of Ghana in 2019 and the Sustainable Development Goals (SDGs) for 2030, which include protecting the natural environment, promoting a resilient built environment, enhancing water resources, improving wetland management, increasing clean energy utilisation, and effectively managing liquid and solid waste. The assessment of ESC during evaluation of tenders and its inclusion in contract documents for public works procurement is critical to the attainment of the following SDGs-2030 objectives: SDG6 for clean water and sanitation, SDG 7 for affordable and clean energy, SDG 9 for industry, innovation and infrastructure, SDG11 for sustainable cities and communities, SDG12 for responsible consumption and production, SDG13 for climate action, SDG14 for life below water and SDG15 for life on land.

THEORIES UNDERPINNING THE STUDY

Sustainable Development (SD)

Sustainable Development (SD) refers to development now and in the future without harming the ecosystem's health (UNESCO, 2021). UNEP (2021) confirmed three sustainability types, sometimes referred to as the "triple bottom line:" environmental sustainability, economic sustainability, and social sustainability.

Aspects are interdependent and prerequisites for each other's existence, as shown in Figure 1 (Gustav & Axel, 2020). The social aspect (society) is essential for the functioning of the financial (economic) aspect, while the environment is necessary for the maintenance of the social aspect (Cato, 2009). The economic aspect encompasses cash flow and expenditures measurements, employment distribution, job growth, EBITA, and revenue growth. The environmental dimension focuses on natural resource use and pollution, including electricity consumption, fossil fuel usage, and solid waste management. Finally, the social aspect concerns employee health, equity, life quality, unemployment rate, average commute rate, and median income (Slaper & Hall, 2011).

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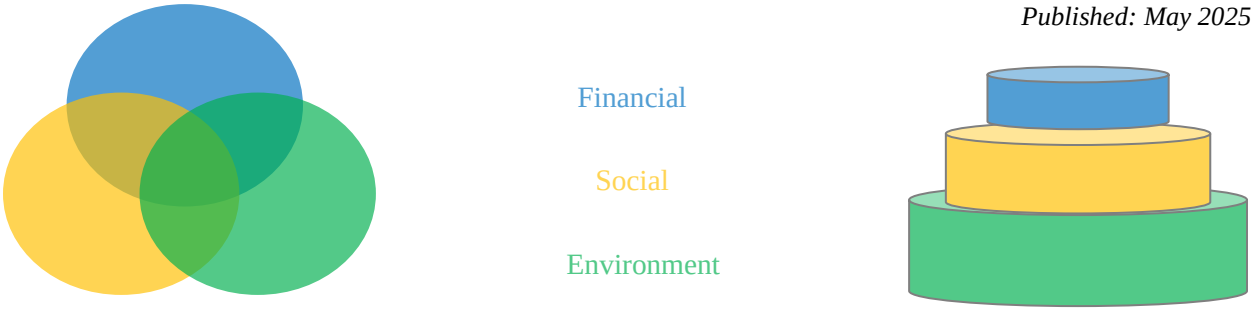

Figure 1: Intersection of financial (Economic), Social and Environmental aspects of SD
Source: Gustav and Axel (2020)

Sustainable Procurement (SP) and Sustainable Public Procurement (SPP)

Sustainable procurement is a process by which organisations fulfil their needs for goods, services, works, and utilities to achieve value for money over the entire lifespan of the products or services. It also benefits the organisation, society, and the economy while minimising environmental harm (UNEP, 2021). When public authorities practise sustainable procurement, it is called Sustainable Public Procurement (SPP).

Sustainable procurement is crucial in reducing negative environmental impacts, such as reducing greenhouse gas emissions, enhancing water efficiency, and supporting recycling efforts (Agbesi et al., 2020). Sustainable procurement practices consider key concepts such as whole-life costing, capacity building, poverty reduction, improved equity, income generation, and cost optimisation (UNEP, 2021).

The Marrakech Task Force on Sustainable Public Procurement (MTF on SPP) was the first global initiative to promote SPP. Launched by the Swiss government in 2005, it was one of the Task Forces established under the Marrakech Process on Sustainable Consumption and Production (SCP), led by the United Nations Environment Programme (UNEP) and the United Nations Department of Economic and Social Affairs (UNDESA).

Sustainable Consumption and Production (SCP) is characterised by using services and related products that meet basic needs and improve quality of life while minimising the use of natural resources, toxic materials, waste emissions, and pollutants throughout the life cycle of the product or service. The aim is to ensure that the needs of future generations are not compromised. Principles of SPP include good public procurement (transparency, fairness, efficiency accountability), leadership commitment, broad policy goals, respect for stakeholder interests and

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building on stakeholder engagement, sound organisational management principles, and monitoring its outputs and outcomes (One Planet Network, 2015).

Public Procurement in Ghana

Public Procurement is the process by which Governments use public funds to purchase goods, works, and services by adopting the following procedures: planning, inviting offers, evaluating offers, accepting offers, awarding contracts, administering or managing contracts, and disposing of stores, vehicles, plants, and equipment.

Public Procurement is viewed as a vehicle to promote sustainability because governments worldwide have high fiscal budgets of about 13% to 20% of GDP for procurement of goods, services, and works. In this regard, policies and regulations are framed to help advance environmental sustainability (UNEP, 2021).

Theoretical Review

Stakeholder Theory

Stakeholder theory provides an important framework for understanding how procurement organisations integrate environmental sustainability. The theory proposes that organisations have responsibilities towards shareholders and other stakeholders who can affect or are affected by company activities (Freeman, 1984).

Previous research has demonstrated how stakeholder pressures have influenced sustainability adoption within procurement. For example, Roman (2017) found that engaging supply chain stakeholders was key to driving sustainable practices within a municipal government in Portugal. Mintzberg (1983) also noted the central role of stakeholder negotiation in shaping organisational strategies and outcomes.

In the works procurement context, key stakeholders pushing environmental agendas include local communities impacted by construction projects, environmental groups, future infrastructure users, and taxpayers funding the initiatives (Preuss, 2009). Through engagement, these stakeholders can socialise sustainability priorities and place issue salience on reducing ecological footprints (Byrch et al., 2015).

However, balancing multiple stakeholder interests presents challenges, as economic objectives sometimes conflict with environmental demands (Carter & Rogers, 2008). Various trade-offs must

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be judiciously managed (Salmi et al., 2016). Integrating stakeholder voices also requires appropriate engagement structures and transparency regarding sustainability performance (Ruparathna & Hewage, 2015).

Institutional Theory

Institutional theory provides a valuable lens for understanding how procurement organisations integrate environmental sustainability compliance. Institutions refer to established norms, rules, and expectations within a social system that guide appropriate behaviour (Scott, 2014). Organisations are embedded within broader institutional environments that shape their operations and practices in pursuit of legitimacy (DiMaggio & Powell, 1983).

Procurement bodies feel pressure to adopt sustainability measures through coercive isomorphism due to growing environmental regulations and stakeholder mandates (Amaral et al., 2017). Normative isomorphism also compels conformity as professional networks propagate best practices around "green" procurement standards (Carter & Rogers, 2008). Meanwhile, mimetic processes lead organisations to model their policies and structures of perceived high-performing peers to appear legitimate and reduce uncertainty (Korsakienė et al., 2015).

Prior research shows how institutional forces have mainstreamed environmental considerations within public and private sector purchasing. For example, compulsory "green criteria" were institutionalised in Spain in public works tenders due to formal standards (Testa et al., 2016). A similar pattern occurred in Turkey as strict environmental laws coercively socialised sustainability into infrastructure contracts nationwide (Akcay, 2023).

However, some argue that mere compliance may result in superficial or "ceremonial" adoption without practical impact (Brammer & Walker, 2011). Sustainable procurement requires complementary social legitimacy where organisations autonomously internalise environmental values through normative alignment with stakeholder priorities (Testa et al., 2014).

The institutional theory provides a robust framework for contextualising the growing institutionalisation of environmental sustainability compliance within public procurement. Future research could further apply the lenses of decoupling vs. organisational change to assess the depth and drivers of work sustainability practices.

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Models for Assessing Environmental Sustainability Compliance in Public Works Procurement

Figure 2 shows a model for Sustainable Public Procurement Regional Implementation Reporting (SDG12.7.1, 2021) that the UNEP uses for reporting. This research work will adopt features like insufficient data or no Implementation of ESC being zero (0). Followed by number one (1), which is the Low level, then two (2), which is the Medium-Low level, then three (3), which is Medium-High level and finally four (4) which is the High Level. This scheme will be employed to grade both the expanse of awareness and the level of compliance with environmental sustainability. Figures 3 and 4 also depict models for assessment to be used in this study.

Figure 2: SPP Regional Implementation Reporting Model.
Source: SDG12.7.1, (2021)

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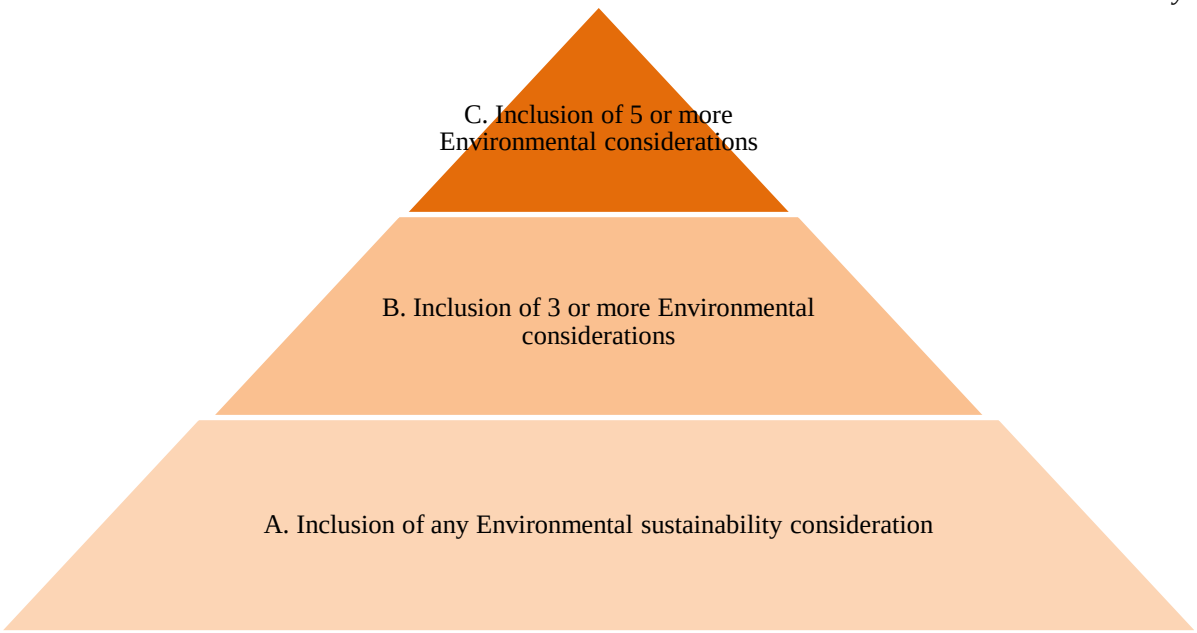

Figure 3: Model for assessing the expanse of ES.
Source: Ponte et al. (2020)

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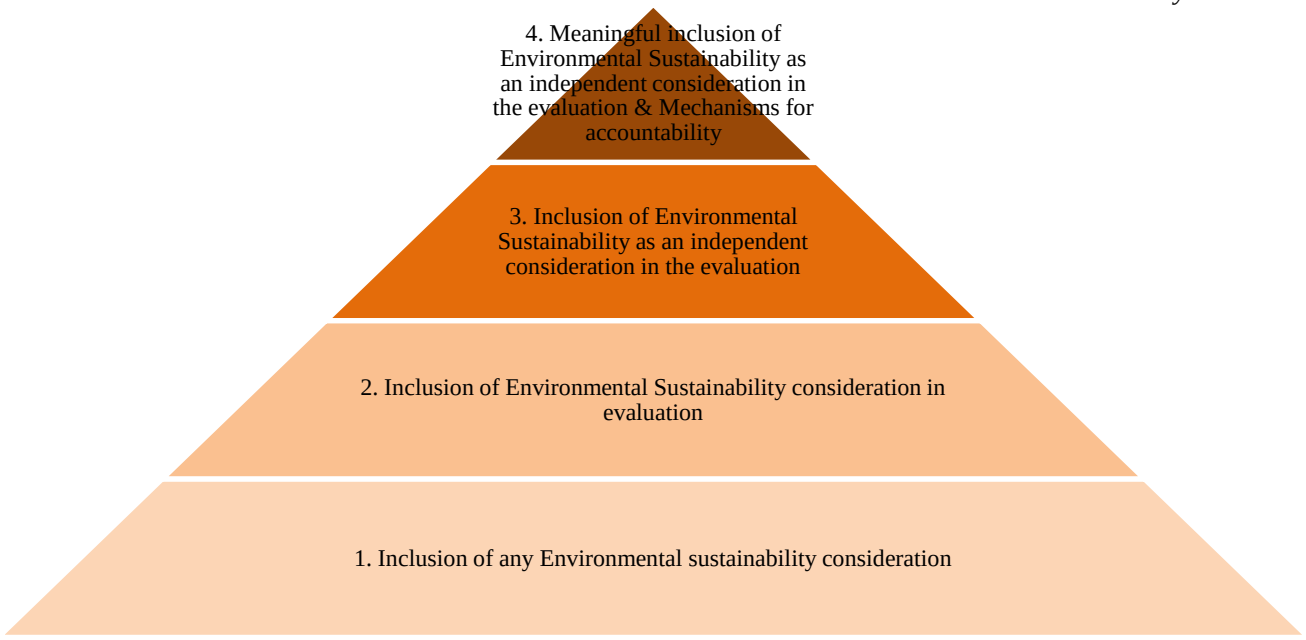

Figure 4: Model for ES integration into the evaluation process.
Source: Ponte et al. (2020)

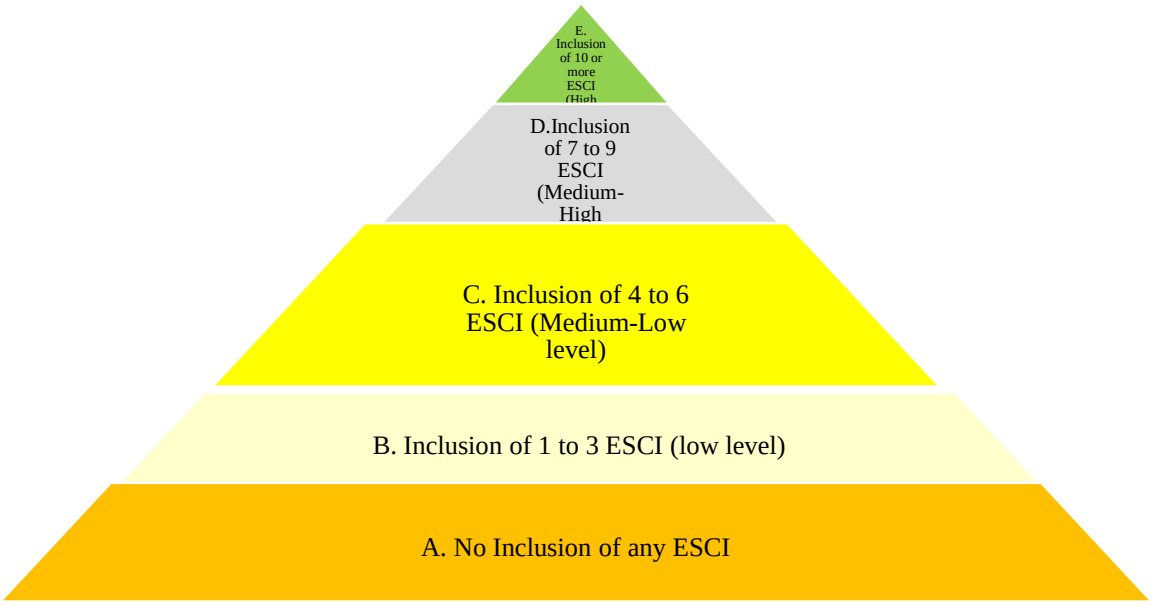

Figure 5: Conceptual Model of Expanse of ESC Criteria.
Source: Author's Construct, (2024)

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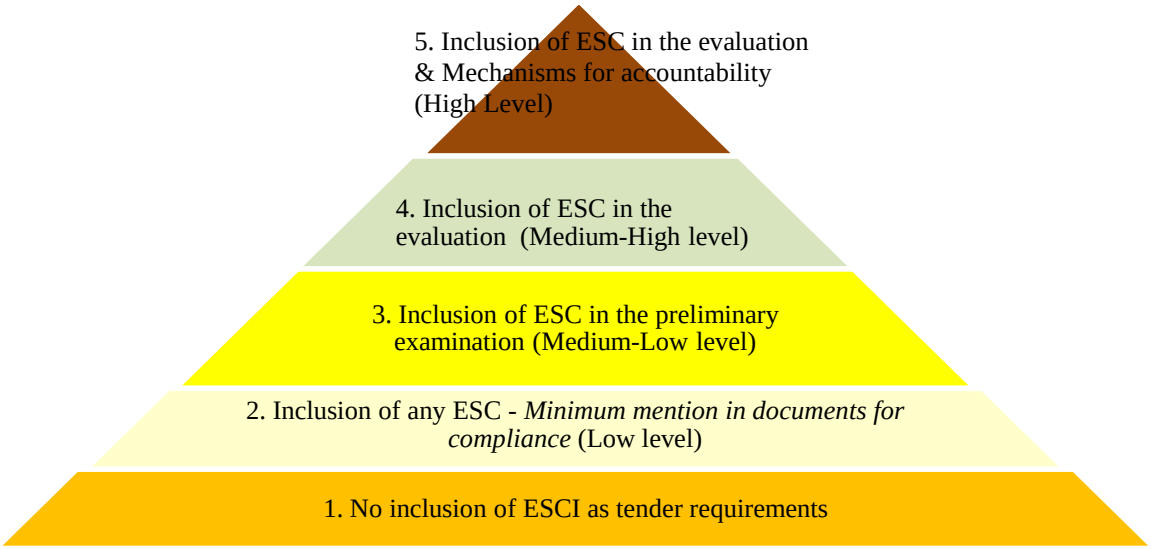

Figure 6: Conceptual Model for compliance level of ES Criteria.
Source: Author's Construct, (2024)

Figures 3 and 4 are ES assessment models from Ponte et al. (2020), which we intend to adopt for this research. Figure 3 is a model for assessing the expanse of ES, whereas Figure 4 is a model for assessing ES integration into the evaluation process (level of compliance). Figure 2.3 has 3 levels on the pyramid for assessing expanse, and Figure 4 has four levels of hierarchy. This research considers the third and fourth levels too small owing to the expanded number of Environmental Sustainability Compliance Indicators (ESCI), which are 13 instead of the eight Ponte et al. (2020) used for assessment. In addition, there is a possibility of zero (0) expanse level or non-compliance with the integration of ES; hence, a first level should be introduced to cater to this. In this regard, we shall attain five (5) levels for our conceptual models or measurement schemes, as seen in Figures 5 and 6, for measuring ES's expanse and ES's level of compliance. Both conceptual models will use a hierarchy of Figure 2, an SPP reporting model.

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RESEARCH METHODOLOGY

General Method

The study adopted a qualitative method for data collection and analysis. The abductive approach best suited this study, and the strategy used was content analyses. The philosophical position was realist, positivism. A convenient sampling was used to obtain 32 relevant samples of tender documents. The research was limited to tender requirements on ESC at the pre-contract stage of public works procurement in leading Universities in Ghana by reviewing the contents of the tender documents. The first three best universities, which are the University of Ghana (UOG), Kwame Nkrumah University of Science and Technology (KNUST), and the University of Cape Coast (UCC) in Ghana in terms of infrastructure and international recognition were selected for this study based on QS World University Rankings, 2023. Even though Technical Universities and Private Universities are part of the QS world university rankings, the study being novelle in nature concentrated on the three for now. Variables considered for the study include the extent of awareness of environmental sustainability in public works procurement and its level of compliance during the evaluation of contractors at the pre-contract stage. The primary data for the assessment and analyses will be based on literature as well as the following documents: accepted tender documents, evaluation reports, and contract documents spanning 2017 to 2023 because this is the period immediately after which the Public Procurement Act, 2003 (Act 663) as amended came into force with ES requirements.

Research Instrument

Two measurement schemes were developed to assess the degree and awareness to which ESCI were integrated into public works procurement. These measurement schemes enabled us to evaluate both the compliance level and the expanse of awareness of ESCI in the procurement process. At the initial stages of our research, it became apparent that although tender documents contained references to ES, the language used was often general and limited in scope. Furthermore, ESCI were frequently absent from the evaluation process, and mechanisms for accountability were lacking. These insights led to the design of the measurement schemes outlined in Figure 5 and Figure 2.6. In addition, content analyses were employed to search through tender documents by employing the following variables:

i) Instruction to tenderer (ITT) for the submission of the environmental management plan (EMP).
ii) Whether or not EMP if submitted, was integrated into the evaluation and award of contracts?

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iii) Inclusion of ES into Conditions of Contract and terms for contract execution, and lastly,
iv) Whether or not environmental managers were requested for in the ITT or provided for in the contract document.

Qualitative Analysis of Data

Considering the size of the data collected, a simple Microsoft Excel Spreadsheet was used to analyse the data by following the steps;
1. the data taken from tender documents were transcribed in Microsoft Word 2016,
2. each tender document was then transcribed into a separate Microsoft Word document and saved under the respective contract names for identification,
3. the transcribed data was then cross-checked with the saved documents to ensure they matched with the tender documents from the content analysis,
4. in Excel, we created individual tabs for each tender document and transferred the data from the MS Word document to the spreadsheet. Each entry was critically analysed to generate themes that may run through, appear once, or seldom repeat.
5. these themes were then explained and backed with literature to give meaning to the patterns.

Limitations

The researcher ensured that variables were set before the analysis to minimise the bias that would have been associated with the content analysis.

FINDINGS AND DISCUSSION

Introduction

Here, we will look at data presentation, analyses, discussions and findings.
Discussions were made on the analysed tender documents from leading universities about ESC expanse of awareness and level of compliance in works procurement.

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Characteristics of Content Analysis Data

Table 1: Frequency of samples on content analysis based on year

PROJECT YEAR	FREQUENCY	PERCENTAGES (%)
2017	1	3
2018	2	6
2019	1	3
2020	3	9
2021	4	13
2022	18	56
2023	3	9
TOTAL	32	100

Source: Field Survey, 2023

Table 1 and Figure 7 show the frequency and percentages of projects analysed on ESC tender requirements from 2017 to 2023. Key points are:

32 projects were analysed for ESC on tender requirements in works procurement.
The highest number of projects analysed was from 2022, with 18 projects representing 56%. Only one project was analysed each in 2017 and 2019. The year 2022 saw a high amount due to the institutions embarking on infrastructural enhancement projects.

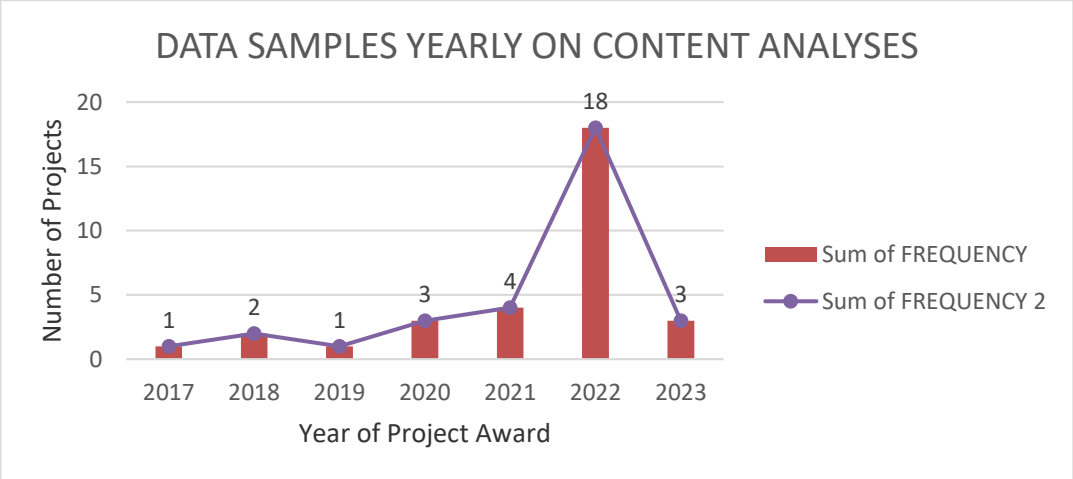

Figure 7: Characteristics of samples on content analysis based on years

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In summary, the data shows that the highest number of projects analysed for ESC were from 2022. The sample seems evenly distributed across other years, with 1-4 projects per year between 2017 to 2021 and 2023. This indicates that projects across multiple years were studied to assess compliance levels.

Table 2: Frequency of samples on content analysis based on types of projects

PROJECT YEAR	NUMBER	PERCENTAGES
Institutional Buildings	10	31
Commercial Buildings	1	3
Renovation Projects	11	34
Residential Buildings	1	3
Factories	1	3
Hostels	2	6
Recreation	2	6
Religious	1	3
Health	1	3
Security And Safety	2	6

Source: Field Survey, 2023

Table 2 and Figure 8 summarise the distribution of the 32 data samples analysed by project type on tender requirements. The samples consisted primarily of institutional buildings and renovation projects.

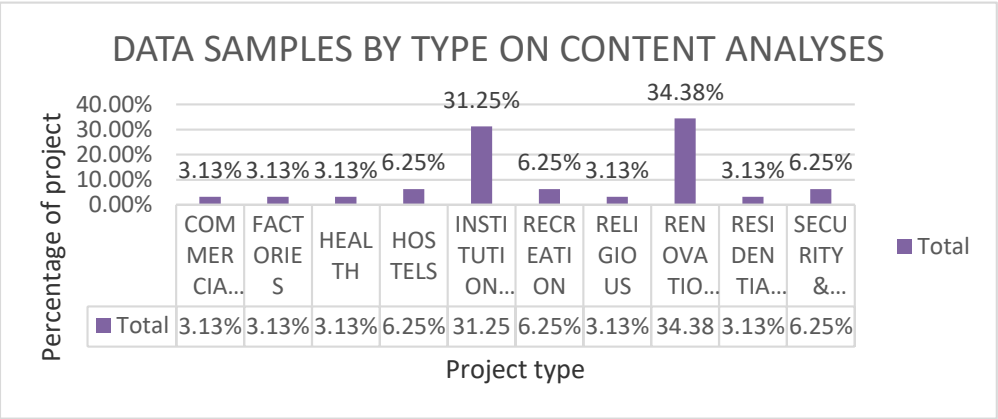

Figure 8: Characteristics of samples on content analysis based on type of project

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Frequency of ESCI in Tender Documents

The sample of 32 tender documents displayed a spectrum of tenderers' occurrence and inclusion of 13 different environmental sustainability compliance indicators. These are illustrated in Figures 9, 10, and 11.

The leading indicators with very high levels of awareness include "reduce construction waste generation" (84% inclusion) and "reduce or avoid dangerous and hazardous chemicals" (84% inclusion).
Over the past decade, these requirements have become widely recognised as important for green and sustainable construction. With construction waste comprising a massive portion of waste volumes around the globe, tenderers have prioritised waste minimisation. Similarly, concerns by tenderers over damage to our ecosystem have spotlighted the need to restrict toxic materials on construction sites because vegetation and other life forms protection resonates strongly due to its visibility. Preserving trees and plant life is a clear and demonstrable environmental sustainability strategy.

Trailing closely behind were moderate awareness levels around 75-78% for "noise reduction", "reduce dust emissions", "reduce emissions of CO_2 and other Greenhouse gases" and proper wastewater disposal. Noise reduction is tied to neighbourhood and community impacts and dust reduction to air quality while limiting emissions of carbon dioxide and other greenhouse gases speaks to a reduction in global warming potential (GWP) and the reduction of ozone depletion potential (ODP), which are climate effect concerns. Proper wastewater disposal connects to resource efficiency and conservation goals. With 4 out of 13 ESCI covering these parameters at this level, they are reasonably well-established components of environmental compliance. However, there is room for improvement to bring them into the 80%+ awareness range by tenderers.

In the middle tier of awareness were reduced resource depletion (materials use savings), water use savings, sediment/erosion control, and proper solid waste disposal, ranging from 44-66%. While proper solid waste disposal may seem like it should rank higher, the focus here was on proper disposal practices for faecal matter rather than minimising waste volumes. Similarly, water use savings, materials use savings, and sediment and erosion controls are important conservation and sustainability practices for resource efficiency but are not yet consistent priorities by tenderers in public works procurement.

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Lastly, the indicators with severe awareness gaps at 22% or below include the protection of fauna and flora, energy use savings, oil, and other noxious spill control. Protecting fauna and flora is a massive challenge globally despite its pivotal impact on the ecological balance. Energy use savings, which connects circular conservation principles but has not yet entered mainstream thought in environmental sustainability, is seriously worrying. In addition, preventing spills of fuels, lubricants, paints, and other chemicals requires rigorous environmental controls that may be underestimated.

In summary, the findings indicate varying levels of awareness about Environmental Sustainability Compliance Indicators (ESCI) in tender documents, highlighting the significance of Stakeholder Theory. This theory posits that organisations have obligations to shareholders and a wider range of stakeholders, including local communities and environmental organisations. The high awareness of indicators such as "reduce construction waste generation" and "reduce or avoid dangerous and hazardous chemicals" (both at 84%) reflects a positive influence from these stakeholders on procurement practices. This high awareness reflects the positive influence of stakeholder pressure on organisations, aligning with Roman (2017), who emphasised stakeholder engagement's role in improving procurement sustainability practices. However, there are notable gaps in awareness regarding indicators like the protection of fauna and flora (22%) and energy savings, suggesting insufficient stakeholder engagement and prioritisation. This aligns with Carter and Rogers (2008), who highlighted the conflict between economic objectives and environmental priorities.

Moreover, Institutional Theory reinforces these findings by illustrating how procurement organisations react to external pressures, including regulations and industry best practices. Incorporating certain ESCI shows a normative isomorphism, where organisations adopt practices to align with perceived environmental standards. Nevertheless, the lack of awareness for some ESCI indicates inconsistent institutionalisation, highlighting the need for increased normative pressure. While some ESCI are well acknowledged, others are not adequately prioritised, emphasising the importance of targeted awareness campaigns to improve compliance.

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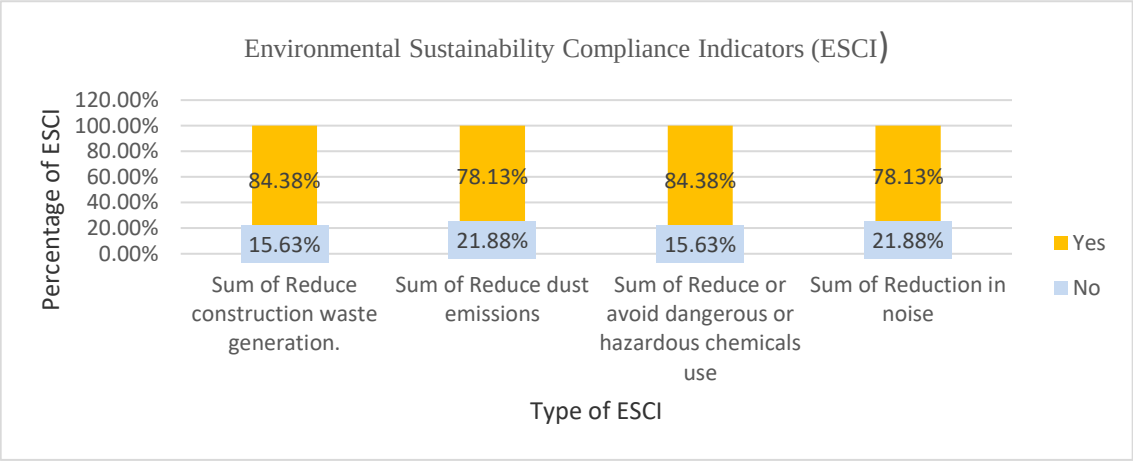

Figure 9: ESCI in works procurement

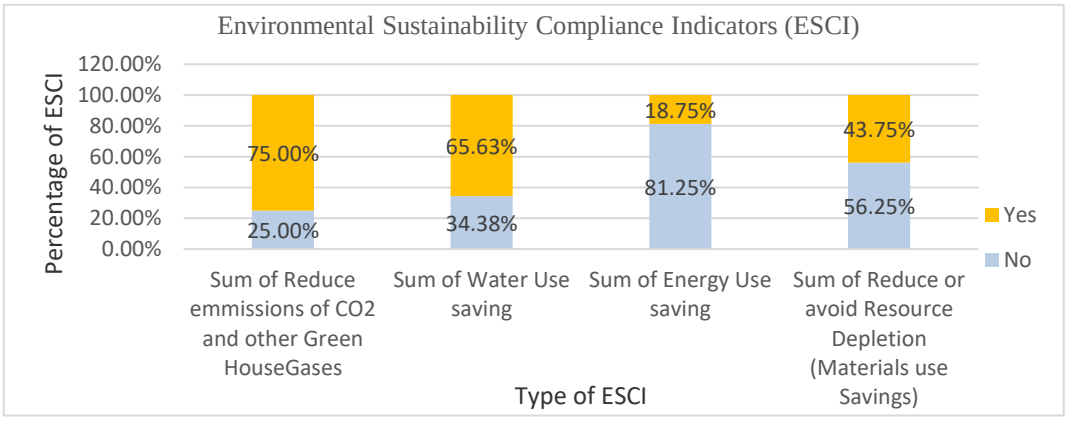

Figure 10: ESCI in works procurement

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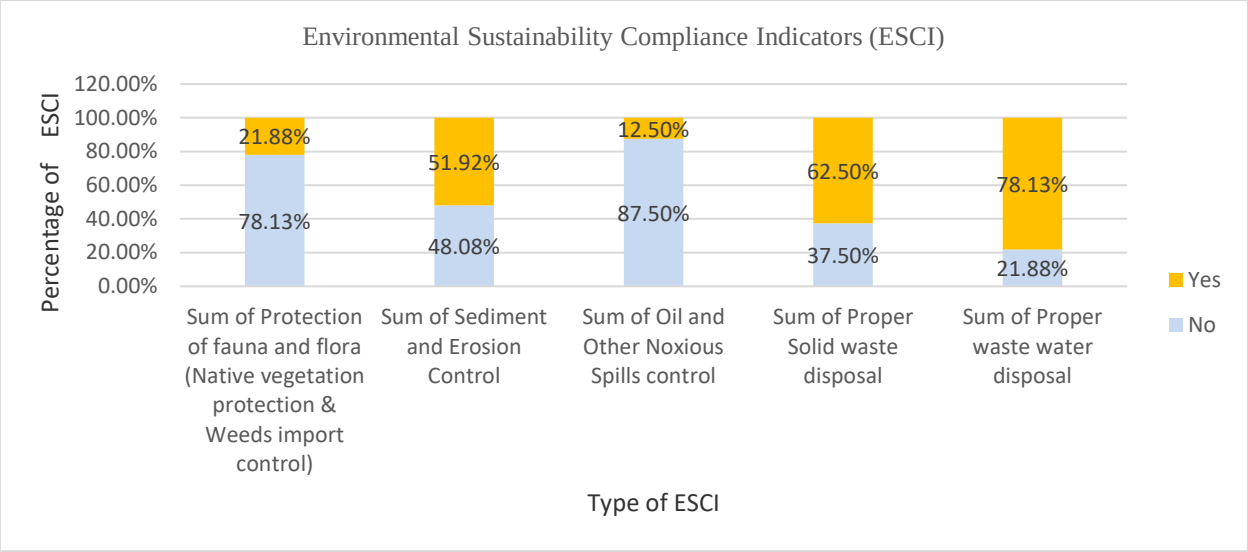

Figure 11: ESCI in works procurement

Expanse of Awareness of ESC

The results in Figure 12 present the extent of ES issues across 32 tender documents for public works procurement. It assesses the awareness level based on the number of environmental sustainability considerations incorporated, ranging from none to 10 or more.

Out of the 32 tender documents, 5 (16%) showed no inclusion of any ESCI. This indicates a complete lack of awareness and non-compliance with ES laws and regulations. Only one tender document (3%) demonstrated low-level awareness by including 1 to 3 ESCI. A slightly higher number, five tender documents (16%), included between 4 to 6 ESCI. This represents a medium-low level of awareness and compliance. A significant portion, ten tender documents (31%), incorporated 7 to 9 ESCI, denoting medium-high awareness. Finally, 11 tender documents (34%) showed a high level of awareness by integrating 10 or more ESCI. This group exceeded the others in awareness.

In summary, less than half of the tender documents, 11 (34%), fell in the Medium-Low, Low**,** and No Compliance Awareness categories by excluding sustainability completely or having six considerations or fewer than six criteria. The other part, which is more than half, that is, 21 documents (66%), displayed Medium-High to High levels of awareness with seven or more ESCI.

The levels of awareness regarding Environmental Sustainability Compliance (ESC) in tender documents reveal a mixed response to stakeholder expectations. While 66% of documents

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demonstrated medium-high to high awareness, indicating adequate stakeholder pressure on organisations to acknowledge environmental sustainability, the 34% showing low to medium-low awareness points to a disconnect between stakeholder expectations and organisational actions. This mixed result reflects the complexity of integrating sustainability into procurement, as discussed by Preuss (2009), who noted that the presence of sustainability in procurement documents can vary significantly based on organisational commitment and stakeholder engagement. This underscores the need for enhanced engagement and education on environmental priorities.

Additionally, these findings align with Institutional Theory, particularly regarding coercive isomorphism, as the inconsistent adoption of sustainability norms across organisations is evident. The significant proportion of documents with low awareness suggests that some organisations may be falling behind in meeting emerging institutional standards for environmental sustainability. Although there is generally above-average awareness in certain areas, documents lacking ESCI highlight the necessity for further training and education among procurement officials. Byrch et al. (2015) emphasise that effective stakeholder engagement and the socialisation of sustainability priorities are vital for improving awareness and ensuring the consistent integration of sustainability practices in procurement processes. The data calls for concerted efforts to boost understanding, capacity building, and commitment at all levels to transition environmental sustainability compliance awareness to about +80% of the target in integral public works procurement practice.

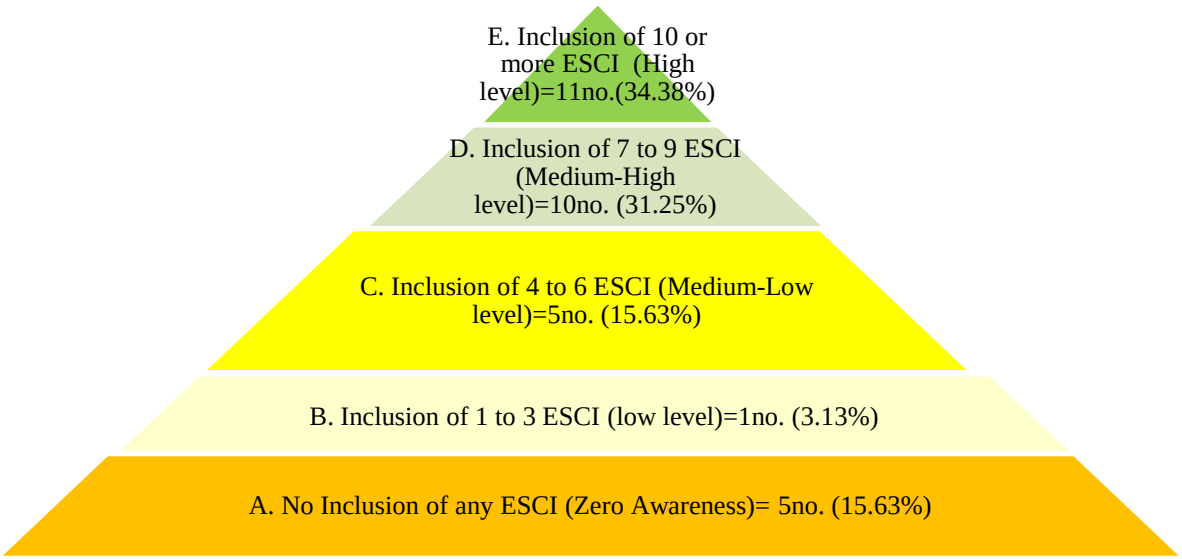

Figure 12: Expanse of Awareness of Environmental Sustainability

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Level of Compliance and Integration of ES into Evaluation

From the content of 32 tender documents, and in Figure 13, 72% of the tender documents gave instructions for an environmental management implementation plan to be submitted as a requirement in instructions to tenderers, while 28% did not. This indicates reasonably good adoption of asking bidders to demonstrate their environmental management implementation plans during tender submissions proactively. However, there remains room to make this the norm across all public tenders.

Only 41% of cases integrated environmental sustainability criteria into the bid scoring and evaluation process, while 59% did not. This highlights a significant gap in utilising environmental sustainability as a substantive evaluation component rather than merely an administrative plan submission.

On a more positive note, detailing environmental sustainability requirements in contract conditions and deliverables was widely embraced, with 88% inclusion against just 12% exclusion. This demonstrates that procurement officers recognise that environmental sustainability must be embedded in contract delivery obligations. However, this is hollow without salient evaluation and monitoring metrics for accountability.

Lastly, only 16% mandated hiring an environmental manager, while 84% did not require this role. This very low rate is disappointing because managers must be accountable for executing sustainability programmes. It reflects a lack of appreciation for operational compliance oversight versus simplistic paper-based planning.

The analysis indicates a mixed record of elevating the significance of environmental sustainability compliance in tendering and works procurement. While the environmental sustainability plan and its inclusion in contract conditions are moderately strong, there are significant deficits in environmental sustainability integration into the evaluation process and staffing. Weighted evaluation metrics and specialised personnel are vital to meaningful compliance outcomes. Hence, there is a pressing need to build capacity and provide policy guidance to public procurement officials on translating high-level environmental sustainability goals into tangible evaluation tools in contract sourcing. This will enable achieving bona fide environmental sustainability performance rather than perfunctory administrative compliance.

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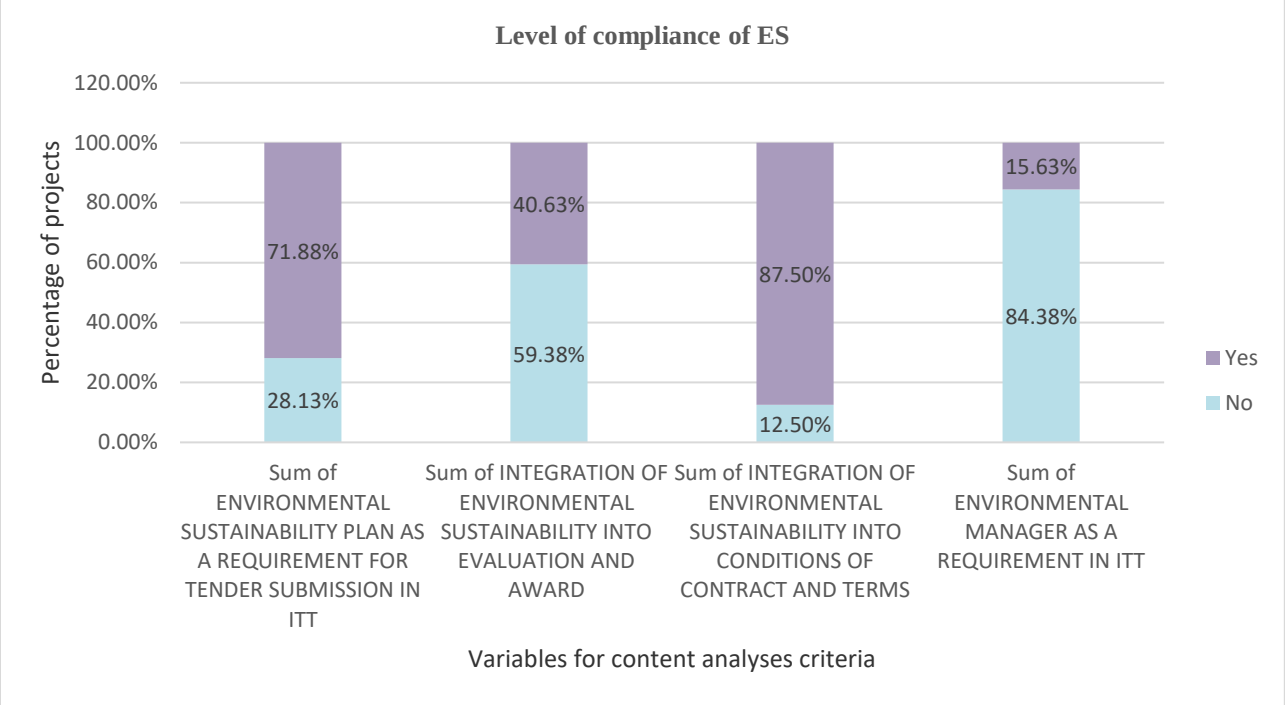

Figure 13: Level of compliance of ES and integration into the Evaluation process
Source: Field Survey, 2023

Figure 14 also presents the level of compliance with environmental sustainability and its integration into the evaluation process of 32 tender documents for public works procurement. This was done by categorising them into the following scale: 1 to 5, with "1" being no inclusion and 5 being high-level inclusion with accountability mechanisms.

Of the 32 tender documents, 3 (9%) showed No inclusion of environmental sustainability as a tender requirement, indicating No compliance. A slightly higher number, 7 tender documents (22%), showed Minimum inclusion by mentioning environmental sustainability in the documents. This is considered a Low level of compliance. 9 tender documents (28%) included environmental sustainability considerations in the Preliminary examination section only. This represents a Medium-Low level of compliance. Ten tender documents (31%) included environmental sustainability as the evaluation criteria. This is considered a Medium-High level of compliance.

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Finally, only three tender documents (9%) demonstrated high compliance by including environmental sustainability in the evaluation and specifying mechanisms for accountability, such as staffing an environmental manager.

In summary, the findings indicate that 72% of tender documents required environmental management plans, only 41% incorporated sustainability criteria into their evaluation processes. This gap suggests a superficial approach to compliance, echoing Brammer and Walker's (2011) assertion that some organisations adopt green procurement practices more ceremonially than substantively. The low integration of sustainability criteria highlights shortcomings in meeting stakeholder commitments, as emphasised by Stakeholder Theory, which stresses accountability to various groups, including communities and environmental advocates.

Furthermore, the requirement for environmental managers is notably low at 16%, illustrating the disconnect between policy and practice. Amaral et al. (2017) argue that compliance often remains ineffective without dedicated roles to oversee sustainability initiatives. The literature suggests a strong need for robust evaluation metrics and accountability mechanisms to ensure that sustainability commitments result in meaningful actions rather than mere formalities.

While the high inclusion of environmental sustainability requirements in contract conditions (88%) reflects an awareness of institutional expectations, the lack of integration into evaluation processes (59%) and the minimal requirement for environmental managers (16%) indicate that compliance may be more superficial than substantive. This discrepancy suggests that organisations may recognise the importance of environmental management plans but are not fully committed to embedding them into their evaluation criteria, potentially leading to stakeholder disillusionment.

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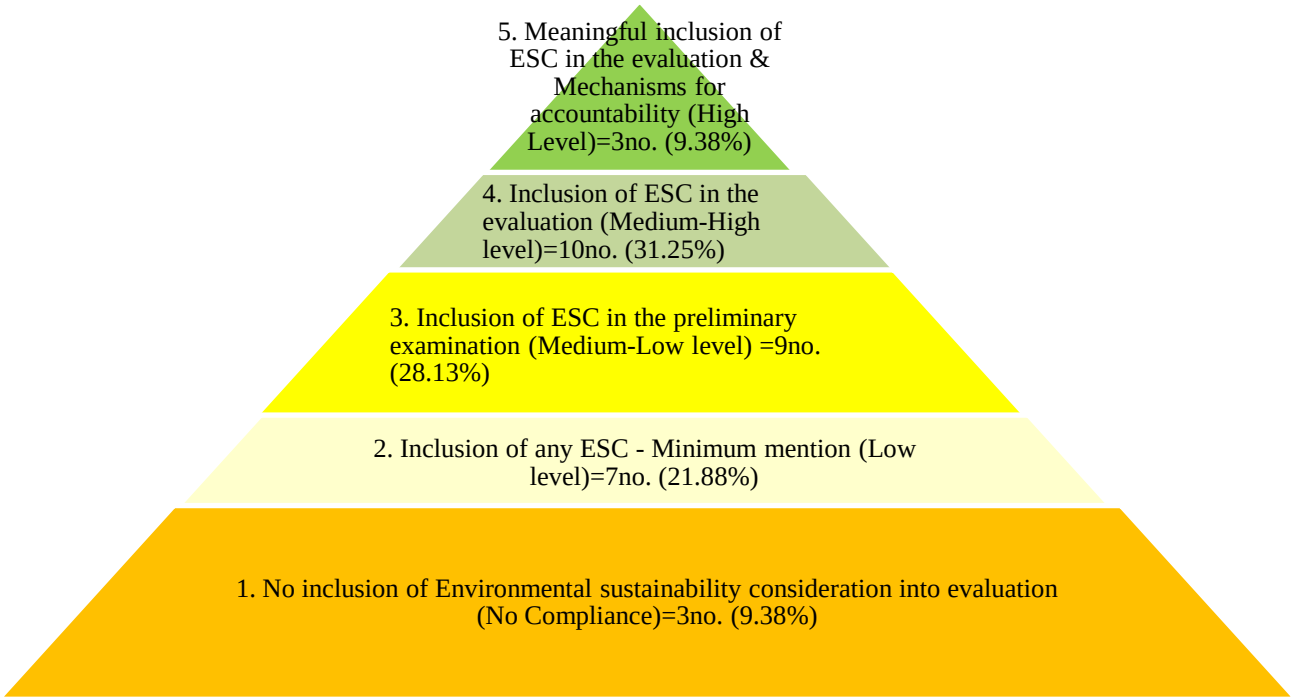

Figure 14: Level of compliance of ES and integration into the evaluation process.

CONCLUSION AND RECOMMENDATION

Conclusion

This research has shown a low compliance level with environmental sustainability and integration into the evaluation process in public works procurement. The extent of awareness of ESC, however, is above average. This implies that there is a significant gap that requires urgent attention for compliance.

The identified gaps underscore the urgent and imperative need to fully integrate environmental sustainability compliance into evaluating tenders in public works procurement. While achieving meaningful integration within the evaluation process may present challenges, it is possible.

In conclusion, considering the widespread commitments and public demand for addressing environmental sustainability compliance, we hope that leaders will take the lead in championing

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the integration of environmental sustainability compliance into public works procurement. This will require allocating the necessary human and financial resources to facilitate its implementation. We firmly believe that such integration will yield substantial benefits for all stakeholders, including advancing existing policy objectives related to climate change and the Sustainable Development Goals (SDGs).

Recommendations

In the study, we recognised the need for substantial influence on the evaluation criteria and comprehensive coverage of environmental impacts to effectively use procurement to advance ESC-related policy objectives.

Recommendations for Policymakers:
1) Strengthen the environmental sustainability requirements in the Public Procurement Act, 2003 (Act663) by mandating the integration of environmental sustainability criteria into the tender evaluation process for all public works contracts.
2) Develop clear guidelines and regulations that specify the environmental sustainability indicators to consider during tender evaluation, such as reducing construction waste, water/energy use savings, and greenhouse gas emissions.
3) Public sector organisations must report annually on compliance with environmental sustainability requirements in public works procurement and establish enforcement mechanisms with penalties for non-compliance.
4) Provide incentives and support programs to help public sector organisations build the necessary capacity and knowledge to effectively integrate environmental sustainability into their procurement practices.

Recommendations for Procurement Practitioners:
1) Ensure environmental sustainability compliance is mandatory in all public works tenders, with clear scoring criteria and weightings applied during the evaluation process.
2) Train procurement staff on how to effectively evaluate tenders for environmental sustainability considerations, including how to assess the indicators used in the study.
3) Engage with the supply market to raise awareness of the importance of environmental sustainability in public works procurement and encourage contractors to incorporate sustainable practices proactively into their bids.
4) Establish internal monitoring and auditing processes to track the environmental sustainability compliance achieved in awarded public works contracts.

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5) Collaborate with other public sector organisations to share best practices and lessons learned on integrating environmental sustainability into procurement.

Recommendations for other Stakeholders:
1) Construction industry associations should develop voluntary environmental sustainability guidelines and standards for their members to adopt in public works projects.
2) Academic institutions should incorporate environmental sustainability in public procurement as a core topic in their construction management, procurement, and sustainability-related curricula.
3) Environmental advocacy groups should engage with policymakers and procurement practitioners to provide input on strengthening environmental sustainability requirements and monitoring mechanisms.

By implementing these recommendations, policymakers, procurement practitioners, and other stakeholders can help accelerate ESC integration into public works procurement, which will help achieve Ghana's sustainability goals and the SDGs.

Limitations

Contract drawings do not form part of contract documents in this research work.

Future Research

Future research is required to analyse environmental sustainability compliance across the board in public works procurement in Ghana.

REFERENCES

Adetunji, I., Price, A., Fleming, P., & Kemp, P. (2003). Sustainability and the UK construction industry. Engineering Construction & Architectural Management, 10(1), 21–35. https://doi.org/10.1108/09699980310459597

Adetunji, I., Price, A., Fleming, P., & Kemp, P. (2008). Measurement of the sustainability of construction projects. Proceedings of the Institution of Civil Engineers: Engineering Sustainability, 161(2), 81–89. https://doi.org/10.1680/ensu.2008.161.2.81

Adham, F., & Siwar, C. (2012). Sustainable development variables affecting construction projects in developing countries. Procedia - Social and Behavioral Sciences, 35, 706–711. https://doi.org/10.1016/j.sbspro.2012.02.117

African Journal of Applied Research
Vol. 11, No. 2 (2025), pp.436-466
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Received: September 22, 2024
Peer reviewed: December 18, 2024
Revised: January 13, 2025
Published: May 2025

Adjarkol, H., Agyekum, K., Ayarkwa, J., & Amoah, P. (2016). Building Technology Department, Takoradi Polytechnic, GHANA; 2, 3, 4 Department of Building Technology, Kwame Nkrumah University of Science and Technology, GHANA. Implementing Environmentally Sustainable Construction Principles (ESCPs) in the Ghanaian Construction Industry.

Agbesi, K., Kissi, E. & Adjei-Kumi, T. (2020). *Implementation of Sustainable Procurement practices in public sector construction in Ghana.*

Ahmed, S. M. (2005). Role of stakeholders' perception in construction project outcome. International Journal of Project Management, 23(1), 35-43. https://doi.org/10.1016/j.ijproman.2004.06.005

Akcay, E.C., (2023). Barriers to Undertaking Green Building Projects in Developing Countries: A Turkish Perspective. *Buildings*, *13*(4), p.841.

Akenroye, T. O. (2011). A multi-criteria evaluation matrix for building design options. Journal of Facilities Management, 9(3), 200–211. https://doi.org/10.1108/14725961111154268

Akenroye, T. O. (2013). Investigating sustainable building life cycle cost elements. Journal of Sustainable Development, 6(1). https://doi.org/10.5539/jsd.v6n1p11

Amaral, D. F., Sivaraman, V., & Shah, H. (2017). Institutional Theory and Sustainable Procurement. Journal of Purchasing and Supply Management, 23(2), 113–122. https://doi.org/10.1016/j.pursup.2016.09.001

Baiden, B. K. (2006). Analysis of defects in new multifamily construction. Journal of Performance of Constructed Facilities, 20(4), 336–344. https://doi.org/10.1061/(ASCE)0887-3828(2006)20:4(336)

Bansal, P., Smith, W. K.,v& Vaara, E. (2018). New ways of seeing through qualitative research. *Academy of Management Journal, 61(4), 1189-1195.*

Bo Xia, Martin Skitmore, Peng Wu, & Qing Chen (2014) How Public Owners Communicate the Sustainability Requirements of Green Design-Build Projects.

Bogdan, R., & Biklen, S. K. (1998). Qualitative research for education: An introduction to theory and methods (3rd ed.). Allyn and Bacon.

Boyd, D., & Schweber, L. (2012). Counteracting construction waste: Co-benefits of sustainability initiatives. Construction Management and Economics, 30(6), 465–476. https://doi.org/10.1080/01446193.2012.676657

Brammer, S. & Walker, H., (2007). Sustainable procurement practice in the public sector: An international comparative study. *University of Bath School of Management. Working Paper Series*.

Bryman, A. (2009). Effective leadership in higher education. International Journal of Continuing Education and Lifelong Learning, 1(1), 13–32.

ISSN: 2408-7920

African Journal of Applied Research
Vol. 11, No. 2 (2025), pp.436-466
http://www.ajaronline.com
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Received: September 22, 2024
Peer reviewed: December 18, 2024
Revised: January 13, 2025
Published: May 2025

Byrch, C., Kearins, K., Milne, M. & Morgan, R., 2007. Sustainable "what"? A cognitive approach to understanding sustainable development. *Qualitative Research in Accounting and Management*, *4*(1), pp.26-52.

Carter, C.R. & Rogers, D.S., 2008. A framework of sustainable supply chain management: moving toward new theory. *International journal of physical distribution and logistics management*, *38*(5), pp.360-387.

Cato, M. S. (2009). Green economics: An introduction to theory, policy and practice. Earthscan.

Chang, W. Y., Ive, G., & Boussabaine, A. (2016). An investigation of waste reduction practices and their significance in the UK precast concrete industry. Journal of Cleaner Production, 137, 556–565. https://doi.org/10.1016/j.jclepro.2016.07.094

Cohen, L., & Manion, L. (1994). Research methods in education (4th ed.). Routledge.

Collins, H., Roberts, K., & Sanders, T. (2006). This mortal coil: The human body in history and culture. Oxford University Press.

Cresswell, J. W. (2003). Research design: qualitative, quantitative and mixed methods approaches (2nd ed.). Sage Publications.

Cresswell, J. W. (2007). Qualitative inquiry and research design: Choosing among five approaches (2nd ed.). Sage Publications.

Cresswell, J. W. (2009). Research design: Qualitative, quantitative, and mixed methods approaches (3rd ed.). Sage Publications.

Cresswell, J. W. (2013). Qualitative inquiry and research design: Choosing among five approaches (3rd ed.). Sage Publications.

Da Ponte, M., Foley, M., & Cho, C. H. (2020). Assessing the degree of sustainability integration in Canadian public sector procurement. *Sustainability*, *12*(14), 5550.

Danermark, B., Ekstrom, M., Jakobsen, L., & Karlsson, J. C. (2019). *Explaining society: Critical realism in the social sciences. Routledge.*

Danquah, P. A., Ahadzie, D. K., & Saakwa-Manu, D. (2019). Assessing the implementation of safety requirements in Ghana's construction industry. Safety Science, 116, 262–270. https://doi.org/10.1016/j.ssci.2019.02.035

Denscombe, M. (2014). The good research guide: For small-scale social research projects (5th ed.). Open University Press.

Dilanthi, A. M., & David, A. D. (2001). Globalization of business and the internet: The plastic payment card industry. International Business Review, 10(1), 67-87. https://doi.org/10.1016/S0969-5931(00)00042-7

DiMaggio, P. J., & Powell, W. W. (1983). The Iron Cage Revisited: Institutional Isomorphism and Collective Rationality in Organizational Fields. *American Sociological Review*, *48*(2), 147–160. https://doi.org/10.2307/2095101

African Journal of Applied Research
Vol. 11, No. 2 (2025), pp.436-466
http://www.ajaronline.com
https://doi.org/10.26437/ajar.v11i2.1045
Received: September 22, 2024
Peer reviewed: December 18, 2024
Revised: January 13, 2025
Published: May 2025

Dudovskiy, J. (2019). Convenience sampling. Retrieved from Research-Methodology.net: https://research-methodology.net/sampling-in-primary-data-collection/convenience-sampling/

Easterby-Smith, M., Thorpe, R., & Jackson, P. R. (2012). Management research (4th ed.). Sage.

Freeman, R.E., (2010). *Strategic management: A stakeholder approach*. Cambridge University Press.

Goni, F. A., Shukor, S. A., Mukhtar, M., & Sahran, S. (2015). Environmental sustainability: Research growth and trends. Advanced science letters, 21(2), 192-195.

Gustav, S., & Axel, B. (2020). Performance evaluation of circular business models in construction. Journal of Cleaner Production, 259, 120824. https://doi.org/10.1016/j.jclepro.2020.120824

Haber, J. (1998). The new construction conflict resolution handbook. The Construction Publishers and Distributors Association.

Hancock, D. R., & Algozzine, B. (2007). Doing case study research: A practical guide for beginning researchers. Teachers College Press.

Hueskes, M., Verhoest, K., & Block, T. (2017). Governing public–private partnerships for sustainability: An analysis of procurement and governance practices of PPP infrastructure projects. International Journal of Project Management, 35(6), 1184–1195. https://doi.org/10.1016/j.ijproman.2017.02.004

Ketokivi, M., & Mantere, S. (2010). *Two strategies for inductive reasoning in organizational research. Academy of Management Review, 35(2), 315-333.*

Ketokivi, M.,& Choi, T. (2014). Renaissance of case research as a scientific method. Journal of Operations Management, 32(5), 232–240. https://doi.org/10.1016/j.jom.2014.03.004

King, L. A. (2004). Measures and Meanings: The Use of Qualitative Data in Social and Personality Psychology.

Korsakienė, R., Diskienė, D., & Smaliukienė, R. (2015). Institutional theory perspective and internationalisation of firms. How institutional context influence the internationalisation of SMES? *Entrepreneurship and Sustainability Issues*, *2*(3). https://doi.org/10.9770/jesi.2014.2.3(3)

Kothari, C. R. (2011). Research methodology: Methods and techniques. New Age International.

Kuhn, T.S. (1962). The structure of scientific revolutions. University of Chicago Press.

Kulatunga, U., Amaratunga, R., & Haigh, R. (2007). Structuring the unstructured data: The use of content analysis. Built Environment & Architecture, 2(1), 89-99. https://doi.org/10.26687/archnet-ijae.v2i1.96

Lewis, J. (2015). Constructing public opinion: How political elites do what they like and why we seem to go along with it. Columbia University Press. https://doi.org/10.7312/lewi17180

African Journal of Applied Research
Vol. 11, No. 2 (2025), pp.436-466
http://www.ajaronline.com
https://doi.org/10.26437/ajar.v11i2.1045
Received: September 22, 2024
Peer reviewed: December 18, 2024
Revised: January 13, 2025
Published: May 2025

Lincoln, Y. S. (2000). On the nature of qualitative evidence. New Directions for Evaluation, 2000(87), 73–83. https://doi.org/10.1002/ev.1186

London, T. (2008). The role of leadership development in sustainable international youth development. New Directions for Youth Development, 2008(118), 47–58. https://doi.org/10.1002/yd.272

Loosemore, M. (2016). Social research methods. Palgrave.

Mantere, S., & Ketokivi, M. (2013). Reasoning in organisation science. Academy of Management Review, 38(1), 70-89.

Mintzberg, H., 1987. The strategy concept I: Five Ps for strategy. *California Management Review*, *30*(1), pp.11–24.

Morelli, J. *(2011).* Environmental Sustainability: *A Definition for Environmental Professionals.*

Naoum, S. G. (2002). Dissertation research and writing for construction students. Butterworth-Heinemann.

Neuman, W. L. (2003). Social research methods: Qualitative and quantitative approaches(5th ed.). Allyn and Bacon.

Nissinen, A., Parikka, K., & Nurmesniemi, M. (2009). Consumer participation in waste management. Waste Management and Research, 27(6), 539-546. https://doi.org/10.1177%2F0734242X09105008

One Planet Network *(2015)*; May 4, 2023

Oppenheim, A. N. (2003). Questionnaire design, interviewing and attitude measurement (2nd ed.). Continuum.

Parthirage, S., Renukappa, S., & Suresh, S. (2005). Construction industry productivity improvement using strategic project framework. Construction Innovation, 5(2), 93-107. https://doi.org/10.1108/14714170510850818

Preuss, L., 2009. Addressing sustainable development through public procurement: the case of local government. *Supply Chain Management: An International Journal*, *14*(3), pp.213-223.

Public Procurement Act, 2003 (Act663) as amended, (Act 914) 2016.

Rajasekar, S., Philominathan, P. and Chinnathambi, V. (2013). Research methodology. arXiv preprint arXiv:physics/0601009. https://arxiv.org/pdf/physics/0601009.pdf

Reichertz, J. (2007). Abduction: The logic of discovery of grounded theory. In A. Bryant and K. Charmaz (Eds.), *The SAGE handbook of grounded theory (p. 214–228). SAGE Publications Ltd.*

Rode, P., Floater, G., Thomopoulos, N., Docherty, J., Schwinger, P., Mahendra, A., & Fang, W. (2017). Accessibility in cities: transport and urban form (pp. 239-273). Springer International Publishing.

African Journal of Applied Research
Vol. 11, No. 2 (2025), pp.436-466
http://www.ajaronline.com
https://doi.org/10.26437/ajar.v11i2.1045
Received: September 22, 2024
Peer reviewed: December 18, 2024
Revised: January 13, 2025
Published: May 2025

Roman, A.V., (2017). Institutionalizing sustainability: A structural equation model of sustainable procurement in US public agencies. *Journal of cleaner production*, *143*, pp.1048-1059.

Ruparathna, R. & Hewage, K., (2015). Sustainable procurement in the Canadian construction industry: challenges and benefits. *Canadian Journal of Civil Engineering*, *42*(6), pp.417-426.

Salmi, A., Quarshie, A. & Leuschner, R., 2016. Sustainability and corporate social responsibility in supply chains: The state of research in supply chain management and business ethics journals.

Saunders, M., Lewis, P., & Thornhill, A. (2003). Research methods for business students (3rd ed.). Pearson Education.

Saunders, M., Lewis, P., & Thornhill, A. (2007). Research methods for business students (4th ed.). Pearson Education.

Saunders, M., Lewis, P., & Thornhill, A. (2009). Research methods for business students (5th ed.). Pearson Education.

Saunders, M., Lewis, P., & Thornhill, A. (2012). Research methods for business students (6th ed.). Pearson Education.

Scott, W. R., (2013). *Institutions and organisations: Ideas, interests, and identities*. Sage publications.

SDG12.7.1. (2021). Degree of implementation of environmentally sound technologies and practices. UN Stats. https://unstats.un.org/sdgs/metadata/?Text=&Goal=12&Target=12.7

Sexton, M. (2004). Quantitative and qualitative approaches to measuring construction project complexity. Engineering, Construction and Architectural Management, 11(1), 7–19. https://doi.org/10.1108/09699980410511934

Slaper, T. F., & Hall, T. J. (2011). The triple bottom line: What is it and how does it work? Indiana Business Review, 86(1), 4-8.

Sourani, A. (2008). Barriers to addressing sustainability in construction: View of contractors. Structural Survey, 26(5), 414–424. https://doi.org/10.1108/02630800810913056

Stemler, S. (2001). An overview of content analysis. Practical Assessment, Research, and Evaluation, 7(17), 137–146. https://doi.org/10.7275/z6fm-2e34

Teddie, C., & Yu, F. (2017). Mixed methods sampling: A typology with examples. Journal of Mixed Methods Research, 1(1), 77-100. https://doi.org/10.1177/1558689877992

Testa, F., Grappio, P., Gusmerotti, N. M., Iraldo, F., & Frey, M. (2016). Examining green public procurement using content analysis: existing difficulties for procurers and useful recommendations. Environment, development and sustainability, 18, 197-219.

Timmons, S., & Ko, D. (2016). *A review of the theory and practice of abductive reasoning. In 2016 IEEE international conference on engineering, technology and innovation/IEEE international technology management conference (ICE/ITMC) (pp. 1-9). IEEE.*

ISSN: 2408-7920

African Journal of Applied Research
Vol. 11, No. 2 (2025), pp.436-466
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https://doi.org/10.26437/ajar.v11i2.1045
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UNEP *(2021) Sustainable Public Procurement; How to Wake the Sleeping Giant! Introducing the United Nations Environment Programme's Approach.*

UNESCO, Sustainable Development *(2021)* Sustainable consumption and production. Available at: www.sustainabledevelopment.un.org/topics/sustainableconsumptionandproduction, [Accessed 19 July 2023].

Upstill-Goddard, J., Frost, M., & Head, L. (2016). Reducing construction waste: Challenges for project managers. Local Environment, 21(10), 1221–1237. https://doi.org/10.1080/13549839.2015.1116452

Vandenstoep, S. W., & Johnston, D. D. (2007). Research methods for everyday life: Blending qualitative and quantitative approaches. John Wiley and Sons, Incorporated.

Yin, R. K. (2003). Case study research: Design and methods (3rd ed.). Sage.

Yin, R. K. (2009). Case study research: Design and methods (4th ed.). Sage.

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