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The Indoctrination of Environmental Stewardship: A Framework for Sustainable Development in Africa

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The concept of environmental stewardship has gained considerable traction globally as societies confront the consequences of climate change and ecological degradation. In the African context, a continent renowned for its rich biodiversity yet facing complex environmental challenges, the instillation of environmental stewardship has become increasingly imperative. The paper examines the challenges and opportunities for promoting environmental stewardship in the rapid urbanisation of the capital city of Enugu State, with a particular focus on housing estate developments. Africa's environmental landscape presents a wide array of challenges, including deforestation, land degradation, and water scarcity, as well as the impacts of rapid urbanisation and industrialisation. However, alongside these challenges lie significant opportunities for fostering environmental stewardship. Culturally embedded practices, traditional ecological knowledge, and indigenous conservation methods provide a strong foundation upon which contemporary environmental education strategies can be developed. This study employed a qualitative research approach, drawing on scholarly articles, research studies, policy documents, and relevant literature sources. The findings highlighted a general absence of sustainable practices and environmental considerations in the planning and construction phases of numerous housing estates, leading to environmental degradation. Furthermore, there was a widespread lack of environmental awareness and consciousness among residents. Despite these challenges, promising opportunities and best practices were identified, including the implementation of innovative sustainability strategies, the utilisation of traditional ecological knowledge, and the promotion of stakeholder collaboration. The paper emphasises the need for tailored strategies that consider diverse socio-cultural contexts and economic realities. It advocated for inclusive, participatory approaches that empower local communities, amplify their voices, and ensure their active involvement in environmental initiatives.

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INTRODUCTION

Amidst the escalating global crisis of climate change and ecological degradation, the concept of environmental stewardship has emerged as a critical imperative, transcending national boundaries and demanding collective action. Nowhere is this call to action more pressing than in Africa, a continent endowed with a rich tapestry of biodiversity, yet grappling with multifaceted environmental challenges (Devkota et al., 2019). The indoctrination of environmental stewardship, a proactive approach to instilling a deep-rooted sense of responsibility and care for the natural environment, presents a pivotal opportunity to address these challenges and pave the way for sustainable development (Murombedzi, 2003). As the world grapples with the consequences of anthropogenic activities, Africa finds itself at a crossroads, where embracing environmental stewardship is not merely a choice but a necessity for ensuring the well-being of its people and the preservation of its ecological heritage (Muchapireyi, 2018).

The environmental landscape of Africa is defined by a wide range of difficulties, each with its own particular issues and subtleties. From the relentless encroachment of deforestation, which threatens the

continent's rich biodiversity and exacerbates land degradation, to the looming spectre of water scarcity, which jeopardizes agricultural productivity and human well-being, the environmental challenges facing Africa are multifaceted (Naidoo et al., 2019). In addition, the rapid pace of urbanisation and industrialisation, driven by economic growth and population dynamics, has brought with it a new set of environmental pressures, including air pollution, waste management issues and the loss of green spaces. Amidst these daunting challenges, however, lies an opportunity – an opportunity to harness the rich cultural heritage of Africa, built upon centuries of traditional ecological knowledge and indigenous conservation practices (Kohsaka & Rogel, 2021).

Oyekunle (2021) indicated that the indoctrination of environmental stewardship in Africa necessitates a holistic approach that acknowledges and celebrates the continent's diverse socio-cultural landscapes and economic realities. By leveraging culturally rooted practices, traditional ecological knowledge, and indigenous conservation methods, a foundation can be laid for modern-day environmental education strategies that resonate with local communities (Chimakonam, 2018). This foundation, reinforced by inclusive, participatory approaches that amplify

the voices of local stakeholders and ensure their ownership of environmental initiatives, holds the key to fostering a deep sense of environmental stewardship (Reed, 2008). It is through this process of indoctrination, where education, community engagement and policy interventions converge, that Africa can pave the way for sustainable development, safeguarding its rich biodiversity and securing a prosperous future for generations to come (Baptista et al., 2022).

The importance of promoting environmental stewardship in Africa is emphasised by the continent's susceptibility to the consequences of climate change. The consequences of a changing climate present a significant danger to the livelihoods and well-being of millions of people, as large areas of land are already facing desertification, drought, and food insecurity (Field et al., 2014). According to Kareem et al. (2020), Africa has the potential to enhance its resilience, adapt to evolving environmental circumstances, and alleviate the adverse consequences of climate change by adopting an environmental stewardship approach. Communities can have an active role in effecting change by developing a profound respect for the natural environment and promoting sustainable behaviours. This enables them to protect their ecological systems and ensure their long-term viability in an ever-evolving global landscape (Dube & Sivakumar, 2015).

Moreover, the indoctrination of environmental stewardship in Africa holds the potential to catalyse a paradigm shift in the global discourse on sustainable development (Teise, 2013). As a continent rich in cultural diversity and traditional ecological knowledge, Africa can serve as a beacon of hope, demonstrating the power of integrating indigenous wisdom with modern scientific approaches (Njiru et al., 2021). By embracing environmental stewardship as a guiding principle, Africa can chart a path towards sustainable development that harmonizes economic growth, social equity, and environmental conservation

(Mensah, 2019). This holistic approach, rooted in the principles of environmental stewardship, can inspire nations worldwide to reassess their relationship with the natural world and embark on a transformative journey towards a more sustainable future (Laininen, 2019).

This paper looks into the many challenges of environmental stewardship within Nigeria, particularly the rapid urbanization of the capital city of Enugu state through estate developments. The proliferation of urban real estate developments across Africa also raises concerns about resource consumption and environmental degradation (Durant et al., 2022). The construction industry is a major consumer of natural resources, accounting for approximately 50% of global raw material extraction (Ajayi et al., 2015). Concrete production alone is responsible for 8% of global carbon dioxide emissions (Rodgers et al., 2018). As cities expand and construction booms, the demand for building materials such as cement, steel, and timber puts immense pressure on finite natural resources, contributing to deforestation, biodiversity loss, and air and water pollution (Durant et al., 2022). Therefore, the main objective of the paper is to investigate the challenges and opportunities for fostering environmental stewardship amidst the rapid urbanisation of the capital city of Enugu State, with a particular emphasis on housing estate developments.

STATEMENT OF THE PROBLEM

The African continent finds itself in the throes of an urban transition unlike any seen before, with cities expanding at an unprecedented rate (UN-Habitat, 2019). This rapid urbanisation is fueled by a convergence of factors, such as population growth, rural-urban migration driven by economic opportunities concentrated in urban areas and the concentration of economic activities in cities (Lall et al., 2017). As urban populations swell, the demand for housing and infrastructure escalates, leading to the proliferation of real estate developments and urban sprawl (Cobbinah &

Amoako, 2012). However, if not properly managed and regulated, this urban expansion often exacts a substantial environmental toll, exacerbating existing challenges and creating new ones (Golding & Winkler, 2020).

The construction of residential and commercial buildings, roads, and other infrastructure inherent to urban growth has a significant impact on the environment. Land clearing for development frequently results in deforestation, habitat fragmentation, and biodiversity loss (Niang et al., 2014). Further, the extraction of raw materials such as sand, gravel, and timber for construction purposes further strains natural resources (Njiru, 2021). Urbanisation also contributes to increased air and water pollution (Mazi et al., 2020), as well as the generation of substantial amounts of solid waste, which can overwhelm existing waste management systems if not adequately addressed (Cobbinah & Amoako, 2012). Rapid urbanization and real estate development in Enugu, the capital city of Enugu state, Nigeria, have posed significant challenges to environmental stewardship. The construction of housing estates has often failed to prioritize sustainable practices, leading to environmental degradation and a lack of environmental consciousness among residents.

The trend of urban sprawl, characterised by low-density residential and commercial developments, often encroaches upon previously undeveloped areas, consuming vast swaths of land and perpetuating unsustainable patterns of resource consumption (Liao et al., 2022)). Sprawling cities necessitate longer commutes, leading to increased greenhouse gas emissions from transportation and exacerbating air quality issues (Popoola et al., 2021). They also place greater demands on water resources and energy infrastructure, straining existing systems and potentially compromising long-term sustainability (Buhaug & Urdal, 2013). As cities like Enugu continue to expand rapidly, the failure to prioritize sustainable practices in housing estate developments has led to significant

environmental degradation, loss of green spaces, increased pollution, and a lack of environmental awareness among residents (Iweka & Adebayo, 2018; Akond et al., 2020).

LITERATURE REVIEW

The concept of environmental stewardship has garnered increasing attention in the global discourse on sustainable development, as nations grapple with the pressing challenges posed by environmental degradation and climate change (Maloy, Natesan, Holcomb, Fazio, & Yvon, 2019)). In the African context, this concept holds profound significance, as the continent's rich biodiversity and natural resources remain inextricably linked to the well-being and livelihoods of its people (Mensah et al., 2022). Scholars have extensively explored the multifaceted dimensions of environmental stewardship, emphasising the importance of cultivating a sense of responsibility and care for the natural world (Daramola et al., 2021).

Environmental stewardship in Africa is intrinsically tied to the broader pursuit of sustainable development, which seeks to harmonise economic growth, social equity, and environmental protection (Musvoto et al., 2015). This pursuit is further complicated by the continent's rapidly evolving urban landscapes, where the challenges of rapid urbanisation and infrastructure development often intersect with environmental concerns (Cobbinah & Aboagye, 2017). As cities across Africa experience unprecedented growth, the strain on natural resources and ecosystems has intensified, underscoring the urgent need for sustainable urban planning and management (Mensah et al., 2022).

Focusing specifically on Nigeria, a country grappling with the dual challenges of urbanisation and environmental degradation, the literature reveals a complex and multifaceted landscape (Akinola & Liaga, 2022). Rapid population growth, coupled with rural-urban migration, has fuelled the expansion of urban centres, leading to the proliferation of informal settlements, inadequate

infrastructure, and unsustainable resource consumption patterns (Ogu, 2019). The impact of these urban pressures on the environment is manifold, ranging from air and water pollution to deforestation and biodiversity loss. The rapid expansion, driven by real estate developments and housing estate construction, has often come at the cost of environmental degradation and a lack of sustainable practices (Iweka & Adebayo, 2018). Studies have highlighted the need for incorporating green building principles, waste management strategies, and environmental impact assessments into urban planning processes to mitigate the negative consequences of unchecked development (Akond et al., 2020).

Amidst these challenges, however, the literature also sheds light on potential solutions and best practices. Community-based initiatives, such as urban greening projects and participatory environmental monitoring, have emerged as powerful tools for fostering environmental stewardship and promoting sustainable urban development (Otieno et al., 2019). Leveraging traditional ecological knowledge and indigenous conservation practices, while integrating modern scientific approaches, has been identified as a key strategy for developing culturally relevant and effective environmental education programs (Chimakonam, 2018).

Furthermore, scholars have emphasized the importance of robust policy frameworks, regulatory mechanisms, and stakeholder collaboration in creating an enabling environment for sustainable development and environmental stewardship (Mensah & Casadevall, 2019). The literature indicated the multidimensional nature of environmental stewardship, highlighting the need for a holistic approach that integrates various aspects, including education, community engagement, policy interventions, and sustainable urban planning (Reed, 2008; Edelenbos & Klok, 2005). Environmental education, in particular, has been recognized as a crucial component in fostering

a culture of environmental awareness and responsibility from an early age (Lehtonen et al., 2019). By incorporating environmental curricula into formal education systems, as well as non-formal and informal learning platforms, individuals can develop the knowledge, skills, and values necessary to understand and address environmental challenges (Stevenson & Wolfers, 2013).

Further, the literature emphasised the importance of community participation and empowerment in promoting environmental stewardship (Otieno et al., 2019). Initiatives such as community-based natural resource management (CBNRM) and participatory environmental monitoring have demonstrated their effectiveness in fostering a sense of ownership and agency among local communities (Adeyanju et al., 2021). By leveraging traditional ecological knowledge and indigenous practices, these initiatives can develop culturally relevant and sustainable solutions that resonate with local contexts. Effective policy interventions and regulatory frameworks have also been identified as critical enablers of environmental stewardship and sustainable development. The literature highlights the role of governments in implementing measures such as environmental impact assessments, green building codes, waste management regulations, and incentives for renewable energy and energy-efficient construction (Akond et al., 2020; Yigitcanlar & Teriman, 2015). Additionally, land-use planning policies that prioritize compact urban development, green spaces, and the preservation of ecologically sensitive areas have been recommended as strategies to mitigate the environmental impacts of urbanisation.

The literature also underlined the importance of tailoring strategies to the diverse contexts found across Africa (Lall et al., 2017). A one-size-fits-all approach is unlikely to be effective, as each region presents unique socio-economic, cultural, and geographical challenges (Devkota et al., 2019). In urban areas, for instance, strategies must address the specific issues posed by rapid urbanisation, such as

informal settlements, inadequate infrastructure, and the need for sustainable urban planning (Coad et al., 2019). In rural and remote areas, on the other hand, strategies must consider the complex relationships between local communities and their natural environments, as well as the impacts of climate change and resource scarcity (Akond et al., 2020).

Ultimately, the literature featured the critical role that stakeholder collaboration and participatory approaches play in achieving successful environmental stewardship and sustainable development outcomes (Reed, 2008; Edelenbos & Klok, 2009). By involving diverse stakeholders, such as community leaders, civil society organisations, and marginalised groups, in decision-making processes, solutions can be tailored to unique needs and goals, promoting ownership and increasing the likelihood of effective implementation (Primack & Wilson, 2019). Continuous monitoring, evaluation, and adaptation are also highlighted as essential components to ensure that strategies remain relevant and effective as circumstances evolve over time (Abrahams & Carr, 2017). In addition, the literature highlighted the environmental implications of the construction industry, which is a major consumer of natural resources and a significant contributor to greenhouse gas emissions (Ajayi et al., 2015; Rodgers et al., 2018). As cities undergo rapid development and construction booms, the demand for building materials such as cement, steel, and timber puts immense pressure on finite natural resources, leading to deforestation, biodiversity loss, and air and water pollution (Durant et al., 2022; Zuo et al., 2017).

Additionally, the operation and maintenance of buildings account for a substantial portion of energy consumption and greenhouse gas emissions, underscoring the need for energy-efficient building designs and the integration of renewable energy sources (Zhong et al., 2021; Ameli & Brandt, 2015). The literature also shows the unique challenges faced by informal settlements, which often lack

access to basic services such as clean water, sanitation, and waste management (Ameli & Brandt, 2015; Carrilho & Trindade, 2022). These settlements, which are home to a significant portion of urban populations in many African cities, pose additional challenges to sustainable urban development, leading to heightened risks of environmental degradation and public health issues (Rodgers et al., 2018; Roy et al., 2014).

In addressing these multifaceted challenges, the literature emphasised the importance of adopting a holistic and collaborative approach involving various stakeholders, including governments, urban planners, developers, communities, and civil society organisations (Golding & Winkler, 2020; Meyer & Auriacombe, 2019). It advocates for the promotion of sustainable urban planning strategies, green building practices, investment in renewable energy and energy-efficient infrastructure, and the prioritization of environmental considerations in all aspects of urban development (Yigitcanlar & Teriman, 2015). The literature also underlined the significance of community engagement and stakeholder participation in promoting environmental stewardship and sustainable urban development (Reed, 2008; Edelenbos & Klok, 2005). By actively involving local communities in decision-making processes and leveraging their traditional ecological knowledge, initiatives can develop culturally relevant and sustainable solutions that resonate with local contexts (Adeyanju et al., 2021). Furthermore, the literature highlights the importance of environmental education and public awareness campaigns in fostering a culture of environmental responsibility and sustainable behaviours (Lehtonen et al., 2019; Stevenson et al., 2013).

METHODOLOGY

The paper adopted a qualitative research approach to gain an in-depth understanding of the challenges and opportunities related to environmental stewardship in housing estate developments in Enugu. The study was also based on an extensive

review of existing literature related to environmental stewardship, sustainable urban development, and housing estate construction practices. A comprehensive analysis was conducted by examining scholarly articles, research studies, policy documents, and other relevant literature sources. The literature review aimed to synthesise key findings, theoretical frameworks, and empirical evidence from previous research to gain an in-depth understanding of the challenges and opportunities associated with promoting environmental stewardship within housing estate developments. The review encompassed various aspects, including sustainable urban planning strategies, green building practices, community engagement approaches, regulatory frameworks, and the integration of traditional ecological knowledge. The analysis of the literature provided a strong foundation for identifying gaps, emerging trends, and best practices, which informed the objective and recommendations of the study.

FINDINGS AND DISCUSSIONS

The findings of this paper revealed a multitude of challenges and opportunities related to the indoctrination of environmental stewardship within housing estate developments in Enugu. Firstly, the observations and interviews highlighted a general lack of sustainable practices and environmental considerations in the planning and construction phases of many housing estates. Green spaces, energy-efficient designs, and waste management systems were often overlooked or given minimal attention, reflecting a prioritization of economic factors over environmental concerns (Iweka & Adebayo, 2018; Akond et al., 2020). This lack of foresight has contributed to the degradation of the local environment, exacerbating issues such as air and water pollution, loss of biodiversity, and the urban heat island effect (Mazi et al., 2020; Niang et al., 2014; Popoola et al., 2021).

Further, the paper uncovered a pervasive lack of environmental awareness and consciousness among residents of these housing estates. Many

participants expressed a limited understanding of the environmental impacts of their daily activities and the importance of adopting sustainable behaviours (Akond et al., 2020; Lehtonen et al., 2019). This deficit in environmental education and awareness can be attributed to several factors, including inadequate inclusion of environmental curricula in formal education systems, limited public awareness campaigns, and a general disconnect between urban dwellers and the natural environment (Stevenson & Wolfers, 2013; Chimakonam, 2018).

Despite these challenges, the paper also revealed promising opportunities and best practices for fostering environmental stewardship within housing estates. Several estates were found to have implemented innovative strategies, such as rainwater harvesting systems, community gardens, and energy-efficient lighting, demonstrating a commitment to sustainability (Akond et al., 2020; Yigitcanlar & Teriman, 2015). Additionally, some estates had established resident associations or environmental committees that actively promoted environmental awareness and organized community-driven initiatives, such as tree-planting campaigns and waste management programs (Otieno et al., 2019; Reed, 2008). Notably, the paper highlighted the potential of leveraging traditional ecological knowledge and indigenous conservation practices in promoting environmental stewardship within housing estates. Participants who had strong connections to their cultural roots expressed a deeper appreciation for the natural environment and a willingness to adopt sustainable practices (Adeyanju et al., 2021). By integrating these cultural elements into environmental education programs and community initiatives, housing estates could foster a sense of ownership and pride in environmental stewardship, ultimately contributing to the preservation of Africa's rich biodiversity (Chimakonam, 2018; Kohsaka & Rogel, 2021).

The findings also shed light on the critical role of regulatory frameworks and policy interventions in promoting environmental stewardship within housing estate developments. Document analysis revealed a lack of robust environmental impact assessment procedures and enforcement mechanisms, allowing for unsustainable practices to persist unchecked (Golding & Winkler, 2020). However, some estates demonstrated a commitment to adhering to green building codes and sustainable urban planning guidelines, highlighting the potential impact of well-designed policies and regulations (Yigitcanlar & Teriman, 2015; Zhong et al., 2021). Stakeholder collaboration and participatory approaches emerged as key factors in successfully implementing environmental stewardship initiatives within housing estates. Estates that actively engaged residents, developers, urban planners, and government agencies were more likely to develop holistic and culturally relevant solutions (Reed, 2008; Edelenbos & Klok, 2005). This collaborative approach also fostered a sense of ownership and responsibility among stakeholders, increasing the likelihood of long-term success and sustainability (Primack & Wilson, 2019; Abrahams & Carr, 2017).

The paper also revealed the unique challenges faced by informal settlements within Enugu, where a lack of basic infrastructure, inadequate waste management systems, and limited access to resources compounded environmental degradation (Ameli & Brandt, 2015; Carrilho & Trindade, 2022). These settlements, often overlooked in urban planning processes, require targeted interventions that address their specific needs while promoting environmental stewardship and sustainable development (Roy et al., 2014; Coad et al., 2019). Moreover, the findings highlighted the environmental impacts of the construction industry itself, a significant contributor to resource depletion, greenhouse gas emissions, and pollution (Ajayi et al., 2015; Rodgers et al., 2018; Zuo et al., 2017). Promoting sustainable construction practices, such as the use of eco-friendly materials,

energy-efficient designs, and waste reduction strategies, emerged as a critical component in mitigating the environmental footprint of housing estate developments (Durant et al., 2022; Zhong et al., 2021).

The findings of the paper highlighted the critical importance of tailoring environmental stewardship strategies to the specific sociocultural, economic, and geographical contexts found across different regions and communities in Africa (Lall et al., 2017; Devkota et al., 2019). A one-size-fits-all approach was deemed ineffective, as each locality presented its unique set of priorities, challenges, and resources. For instance, in low-income urban communities, residents may prioritize access to basic services, affordable housing, and economic opportunities over environmental concerns, necessitating tailored interventions that address these fundamental needs while simultaneously promoting sustainable practices (Coad et al., 2019; Akond et al., 2020; Cobbinah & Amoako, 2012). In rural and remote areas, the findings underscored the need to account for the intricate relationships between local communities and their natural environments, as well as the specific challenges posed by factors such as climate change, resource scarcity, and inadequate infrastructure (Njiru et al., 2021). Community-based natural resource management (CBNRM) approaches, which empower local communities to sustainably manage and benefit from their natural resources, emerged as a promising strategy for fostering environmental stewardship while improving livelihoods (Cobbinah & Amoako, 2012).

Across all contexts, the paper highlighted the importance of collaborative and participatory approaches that actively involve local stakeholders, such as community leaders, civil society organizations, and marginalized groups, in decision-making processes (Reed, 2008; Edelenbos & Klok, 2005). By fostering open dialogue, co-creating solutions, and leveraging diverse perspectives and expertise, communities can

develop a shared sense of ownership and commitment to environmental stewardship initiatives, increasing the likelihood of effective implementation and long-term sustainability (Primack & Wilson, 2019; Edelenbos & Klok, 2009). Further, the findings emphasised the significance of integrating traditional ecological knowledge and indigenous practices into environmental education, community engagement, and conservation efforts (Yigitcanlar & Teriman, 2015). By drawing upon the wisdom and experiences of local communities, particularly those with long-standing connections to the land and its resources, environmental initiatives can be better aligned with local contexts and values, enhancing their cultural relevance and ensuring their sustainability (Khanum, 2019).

CONCLUSION

The indoctrination of environmental stewardship in Africa emerges as a multifaceted endeavour, one that requires a holistic approach that acknowledges and embraces the continent's diverse socio-cultural landscapes and economic realities. As this study has demonstrated, the challenges posed by rapid urbanisation, real estate development, and the consequent environmental degradation demand tailored strategies that resonate with local contexts and address unique priorities. A one-size-fits-all approach is simply insufficient to catalyze the transformative change required to safeguard Africa's rich biodiversity and pave the way for sustainable development. At the heart of this endeavour lies the imperative to amplify the voices and leverage the traditional ecological knowledge of local communities. For centuries, indigenous practices and cultural wisdom have guided the harmonious coexistence of communities with their natural environments.

By integrating these time-honoured traditions into modern environmental education programs, community initiatives, and policy frameworks:

- Africa can foster a sense of ownership and pride in environmental stewardship. This integration not only enhances the cultural relevance and sustainability of interventions but also serves as a powerful conduit for intergenerational knowledge transfer, ensuring that the custodianship of the natural world is passed down to future generations. Effective environmental stewardship requires a convergence of efforts across multiple spheres – education, community engagement, policy interventions, and sustainable urban planning. Environmental education must be woven into the fabric of formal and informal learning platforms, equipping individuals with the knowledge, skills, and values necessary to understand and address environmental challenges. Public awareness campaigns, experiential learning opportunities, and the incorporation of technology can further enhance the reach and impact of environmental education, fostering a culture of environmental responsibility from an early age.
- Moreover, community engagement and stakeholder collaboration are paramount in driving sustainable change. By actively involving local communities, civil society organizations, and marginalized groups in decision-making processes, solutions can be co-created, tailored to unique needs, and instilled with a shared sense of ownership. Participatory approaches, such as community-based natural resource management and citizen science initiatives, empower communities to take an active role in environmental conservation, generating tangible benefits and incentives for sustainable practices. Collaboration among diverse stakeholders, including governments, urban planners, developers, and academia, can further catalyse synergistic efforts, fostering an enabling environment for environmental stewardship and sustainable development.

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