



Sustainable Environment and the built Space: Integrating Ecology, Planning and Human Well-being

Proceedings of the 6th International Conference (FESCON 2026) at Chukwuemeka Odumegwu Ojukwu University,
Uli Campus, Uli, Nigeria
18 - 19 June 2026

DECOLONISING ENVIRONMENTAL SUSTAINABILITY: INDIGENOUS AFRICAN ECOLOGICAL THOUGHT, PLANNING, AND HUMAN FLOURISHING IN NIGERIA

Emmanuel Ezulofor¹ & Drake Omonode²

^{1,2}Department of Educational Foundations, Faculty of Education, University of Benin

Email: drakeomams@gmail.com

Abstract

This paper interrogates the coloniality of contemporary environmental sustainability discourse from the standpoint of Philosophy of Education, with Nigeria as a critical reference point. It argues that dominant sustainability frameworks often present ecological care as a modern, scientific, and technocratic project, thereby marginalising indigenous African systems that had long integrated land, ecology, planning, spirituality, communal responsibility, and human flourishing. Drawing on indigenous African environmental thought, the paper shows that practices such as sacred grove conservation, shifting cultivation, intercropping, fallowing, seed preservation, manure use, water-source protection, communal land ethics, and climate-responsive architecture were not accidental cultural habits but structured ecological pedagogies. These practices reveal a worldview in which land is sacred, communal, ancestral, ecological, and moral rather than merely economic property. The paper therefore contends that environmental education and planning in Nigeria should not simply transmit imported sustainability theories but recover indigenous ecological knowledge as a legitimate source of curriculum, policy, and planning practice. It concludes that a decolonised sustainability framework must combine scientific knowledge with indigenous ecological pedagogy in order to promote ecological resilience, cultural continuity, and human flourishing.

Keywords: Environmental sustainability, decolonisation, indigenous knowledge, ecological pedagogy, human flourishing, Nigeria

1.0 INTRODUCTION

Environmental sustainability has become one of the defining concerns of contemporary education, development, and planning. However, much of the dominant discourse presents sustainability as though it were primarily a modern scientific discovery, expressed through global policy language, technical indicators, climate models, and institutional planning frameworks. While these tools remain important, they can become epistemically narrow when they ignore the ecological intelligence already embedded in indigenous African cultures. In many African societies, environmental care was not separated from ethics, spirituality, land use, social order, and human well-being. Sustainability was not merely taught as theory; it was lived through farming systems, settlement patterns, water practices, taboos, rituals, communal land governance, and intergenerational instruction (Eyong, 2004; Alokwa & Ezenwaji, 2015).

This paper approaches the problem from Philosophy of Education by asking what kind of knowledge counts in environmental education and whose ecological wisdom is recognised as legitimate. It argues that

colonial education and development systems often displaced African indigenous knowledge by treating it as informal, pre-scientific, or merely cultural, while privileging Western technocratic models as universal. Such a hierarchy weakens environmental education in Nigeria because it disconnects learners from the ecological traditions through which their own communities historically understood soil, water, forests, animals, seasons, settlement, and communal survival.

The central claim of this paper is that indigenous African environmental thought offers a richer and more integrated understanding of sustainability. Practices such as sacred grove protection, Yoruba shifting cultivation, intercropping, fallowing, Hausa earth architecture, seed preservation, manure use, and communal water-source protection demonstrate that African societies historically linked ecology, planning, and human flourishing. Therefore, a decolonised Nigerian environmental education and planning framework must recover indigenous ecological pedagogy, not as nostalgia, but as a living intellectual resource for sustainable futures.

2.0 CONCEPTUAL CLARIFICATION

Sustainability

Sustainability, as conventionally defined in literature, refers to the ability of human systems to meet current needs without compromising the ability of future generations to meet theirs (Eyong, 2004). Within the environmental discourse, sustainability embodies the balancing of ecological integrity, economic growth, and social equity, often framed in policy as the triad of environmental, economic, and social pillars (Smitsman, Deenapanray, & Chung Kim Chung, 2014). Standard definitions generally assume a technocratic approach, emphasizing measurable outcomes such as resource efficiency, emission reduction, or biodiversity preservation, frequently excluding culturally embedded knowledge systems and indigenous governance structures (Bonnett, 2002; Grenier, 1998).

Critically, the examination of African contexts challenges this orthodoxy. Indigenous African communities historically operationalized sustainability through relational and practice-based knowledge that inherently integrated ecology, social structures, and human well-being (Alokwa & Ezenwaji, 2015). The mechanistic and quantitative lens promoted in conventional sustainability models often alienates these dimensions, overlooking how traditional agricultural systems, sacred forests, and communal governance mechanisms ensured regenerative ecological cycles and intergenerational equity (Eyong, 2003; Šūmane, Kunda, Knickel, Strauss, Tisenkopfs, des Ios Rios & Ashkenazy, 2018). For instance, Shifting-cultivation mimicked natural biodiversity in the sense of preserving soil fertility while ensuring subsistence (a practice ignored by classical definitions emphasizing static metrics) (Alokwa, 2009).

Considering these insights, sustainability in the African context should be reconceptualized as a dynamic and relational construct, where ecological preservation, social cooperation, and ethical stewardship are inseparable. It is less a target to achieve through abstract indicators and more a continuous practice mediated by cultural norms, moral order, and community responsibility (Chibvongodze, 2016). Thus, in this research, sustainability is interpreted not only as environmental maintenance but as a process of cultural-ecological integration, mediated by long-standing indigenous practices.

Decolonisation

Decolonisation, as conventionally defined, involves the dismantling of colonial structures of power, knowledge, and epistemology (Ndlovu-Gatsheni, 2018). In environmental and educational contexts, decolonisation is often operationalized as the inclusion of marginalized voices and perspectives, challenging the dominance of Western paradigms (Bonnett, 2002). Rule-of-thumb definitions frame

decolonisation as a corrective strategy to replace Eurocentric knowledge with pluralistic or hybrid models, often emphasizing political or institutional reform.

However, studies indicate that decolonisation extends beyond institutional restructuring to the epistemic level (Eyong, 2004; Hope, 2020). African indigenous knowledge systems (IKS) were historically marginalized through colonial education, religion, and policy interventions, which imposed mechanistic and reductionist scientific models (Alokwu & Ezenwaji, 2015). The imposition of Western cosmologies disrupted community-integrated ecological practices, creating a dichotomy between “scientific” and “traditional” knowledge that devalued centuries of adaptive, place-based environmental wisdom (Alokwu, 2009; Šūmane, et al 2018). Empirical studies from Central Africa demonstrate that this marginalization contributed to the erosion of sustainable agricultural practices such as sacred forest management, and holistic governance frameworks (Eyong et al., 2004; Šūmane, et al 2018).

The critical insight is that decolonisation should not merely replace knowledge systems but rather reintegrate indigenous epistemologies as co-constitutive with modern scientific frameworks. It entails an epistemic shift that validates local environmental ethics, moral codes, and cosmologies as authoritative for environmental governance and planning (Alokwu & Ezenwaji, 2015; Alokwu, 2009). Decolonisation, in the context of this paper, thus represents a framework for epistemic pluralism that recognizes the historical, ethical, and ecological wisdom embedded in African communities.

Indigenous Knowledge

Indigenous knowledge (IK) is traditionally defined as the cumulative body of knowledge, practice, and belief evolving through adaptive processes, transmitted orally across generations, and deeply embedded in local ecological, social, and spiritual systems (Grenier, 1998; Berkes, 1999). Standard definitions emphasize its empirical and practice-based nature, often contrasted with codified Western scientific knowledge (Warren, 1992; Posey & Dutfield, 1996).

Critical analysis from studies reveals that IK in Africa encompasses more than empirical observations; it embodies moral, cosmological, and social principles that shape ecological behavior (Alokwu & Ezenwaji, 2015; Eyong, 2003). For instance, food taboos, sacred groves, and resource rotation are culturally-codified not merely for instrumental utility but as moral obligations enforced through cultural and spiritual norms (Alokwu, 2009). Western-centric definitions, by ignoring these dimensions, reduce IK to raw empirical data rather than a structured ethical-ecological framework.

Integrating insights from this research, IK should be conceptualized as a holistic system of adaptive knowledge that is simultaneously ecological, social, and ethical. It functions to maintain biodiversity, regulate resource use, and ensure human flourishing through embedded moral codes and cultural norms (Eyong, 2004; Šūmane, et al 2018). IK, therefore, is not merely supplementary to modern science but constitutive of sustainable environmental and social practice.

Ecology

Ecology is generally understood as the scientific study of interactions between organisms and their environment, often emphasizing biological networks, ecosystem services, and population dynamics (Eyong, 2003; Smitsman et al., 2014). Standard interpretations prioritize empirical measurement, conservation biology, and quantitative modeling.

However, studies highlight that in indigenous African contexts, ecological knowledge is inseparable from human practice and moral philosophy (Alokwu & Ezenwaji, 2015; Alokwu, 2009). The African cosmology perceives humans as embedded within ecosystems, with responsibilities codified through ritual, taboo, and

community governance (Chibvongodze, 2016). Consequently, ecological practice is inherently normative and relational, encompassing ethics, governance, and spirituality alongside biological understanding (Eyong, 2004; Šūmane, et al 2018).

Post-analysis, ecology should be conceptualized in this paper as an integrative human-ecological system, where environmental interactions are mediated by ethical, cultural, and spiritual norms. The boundaries of ecological study expand beyond flora and fauna to include human agency and moral responsibility in resource management (Alokwa & Ezenwaji, 2015).

Planning

Planning is commonly defined as a systematic process of designing and coordinating human activities to achieve predefined objectives, often in spatial, economic, or environmental domains (Smitsman et al., 2014; Bonnett, 2002). Conventional planning theory prioritizes rational, centralized, and technocratic models that rely on codified knowledge and standardized procedures.

Critical evaluation reveals that in African contexts, planning is embedded in communal governance, indigenous law, and ecological ethics (Eyong, 2004; Šūmane, et al 2018). The pre-colonial African planning approach emphasized relational resource management, intergenerational equity, and community participation (Alokwa, 2009; Chibvongodze, 2016). Western rationalist frameworks often ignore these embedded dimensions, creating an epistemic dissonance between technical planning and lived ecological knowledge (Alokwa & Ezenwaji, 2015).

Consequently, planning in this paper is interpreted as a participatory and context-sensitive process. It is one that integrates empirical knowledge with indigenous governance, ethical imperatives, and ecological insights. It is not only a technical exercise but a moral-ecological negotiation between humans, communities, and ecosystems (Eyong, 2004; Šūmane, et al 2018).

Human Flourishing

Human flourishing, in conventional philosophy, refers to the holistic well-being of individuals, encompassing physical health, psychological well-being, social engagement, and fulfillment of potential (Bonnett, 2002; Smitsman et al., 2014). Definitions typically abstract flourishing from environmental or cultural embeddedness.

Analysis of African indigenous practices, however, reveals that flourishing is inherently ecologically and communally embedded. The well-being of humans cannot be decoupled from ecological health, resource sustainability, or the moral and social cohesion of the community (Alokwa & Ezenwaji, 2015; Alokwa, 2009). African cosmologies conceptualize flourishing as a balance between humans, spirits, animals, plants, and natural forces (Chibvongodze, 2016). Disruption of these balances through colonial interventions or unsustainable development practices compromises both ecological and human well-being (Eyong, 2004; Šūmane, et al 2018).

Therefore, human flourishing for this paper is interpreted as a multi-dimensional construct that integrates ethical, social, and ecological dimensions, emphasizing relationality, intergenerational equity, and environmental embeddedness.

3.0 THE COLONIALITY OF SUSTAINABILITY DISCOURSE

The discourse of environmental sustainability is often predicated on the assumption that globally accepted scientific knowledge and technocratic methods are universally valid, objective, and sufficient for addressing

ecological crises. Conventional sustainability language, as codified in global environmental frameworks and policy directives, assumes that standard metrics, such as resource efficiency, carbon reduction, and ecosystem service valuation, are adequate to measure ecological balance (Eyong, 2004). This rule-of-thumb perspective also presumes that indigenous practices, local knowledge, or culturally embedded ecological ethics are secondary, anecdotal, or non-scientific, thus legitimizing a universalist approach to sustainability and environmental governance (Alokwu & Ezenwaji, 2015). The prevailing assumption is that modernization, industrial development, and technical rationality are inherently superior to traditional systems of ecological management (Alokwu, 2009).

Critical interrogation of African indigenous contexts, however, exposes the limitations of these assumptions. Empirical studies from Central and West Africa demonstrate that indigenous knowledge systems (IKS) embody sophisticated, adaptive, and empirically validated methods for ecological management, resource conservation, and disaster mitigation (Eyong et al., 2004; Šūmane, et al 2018). For example, shifting cultivation, agroforestry, sacred forests, and resource rotation reflect deeply intergenerationally tested practices that maintain soil fertility, biodiversity, and sustainable yields while ensuring social cohesion and ethical stewardship (Alokwu, 2009; Alokwu & Ezenwaji, 2015). These practices are inseparable from community norms, cosmological ethics, and moral orders, challenging the assumption that Western scientific paradigms are uniquely capable of securing sustainability (Chibvongodze, 2016). The mechanistic, reductionist lens of conventional sustainability often disregards these relational and moral dimensions, thereby marginalizing indigenous contributions (Alokwu, 2009).

The coloniality of sustainability discourse becomes apparent in how environmental knowledge is hierarchized. Historical analyses reveal that colonial and post-colonial environmental policy often dismissed African ecological systems as primitive, while privileging Western technoscience as the sole authority (Eyong, 2003; Eyong, 2004). Indigenous practices, though effective and locally validated, were excluded from formal planning, conservation projects, and climate response frameworks, effectively rendering African environmental epistemologies invisible within official discourse (Alokwu & Ezenwaji, 2015; Šūmane, et al 2018). The imposition of external governance, legal regimes, and development paradigms restructured local knowledge hierarchies, creating epistemic dependency and disembedding ecological practice from community contexts (Hope, 2020). Moreover, intellectual property regimes and bioprospecting further reinforced the marginalization of indigenous knowledge, commodifying it without recognition or restitution to the communities that generated it (Eyong, 2003; Eyong et al., 2004).

Therefore, an emergent critical insight is that sustainability must be reconceptualized to incorporate indigenous epistemologies as co-constitutive knowledge systems. Rather than viewing IKS as informal or anecdotal, they should be acknowledged as empirical, adaptive, and ethically informed systems capable of achieving ecological balance while fostering human flourishing (Alokwu & Ezenwaji, 2015; Alokwu, 2009). Decolonial approaches to climate and environmental governance argue that integrating these knowledge systems enhances the legitimacy, contextual relevance, and resilience of sustainability strategies, thereby addressing the epistemic biases inherent in globalized policy frameworks (Eyong, 2004; Šūmane, et al 2018). Recognizing indigenous ecological ethics also exposes the socio-moral dimensions of environmental management, highlighting that sustainability is not merely a technical objective but a relational practice embedded in cultural, ethical, and spiritual norms (Chibvongodze, 2016).

From the perspective of this paper, the coloniality of sustainability discourse is not merely a historical artifact. It is one that shapes contemporary environmental practice, policy prioritization, and climate adaptation. The insights derived from African IKS suggest that a decolonized sustainability framework should integrate traditional ecological knowledge, moral ethics, and communal governance structures alongside formal scientific methods. This integration redefines sustainability from a purely technocratic

goal to a relational, ethically grounded, and culturally situated practice, capable of simultaneously preserving ecosystems, enhancing human well-being, and ensuring intergenerational equity (Alokwu & Ezenwaji, 2015; Alokwu, 2009; Eyong, 2003). Ultimately, decoupling sustainability from colonial epistemic assumptions allows for the emergence of strategies that are empirically robust, culturally resonant, and philosophically coherent within African ontologies of ecology and human flourishing.

4.0 INDIGENOUS AFRICAN ENVIRONMENTAL THOUGHT

Mainstream environmental and development discourse often assumes land is a commodifiable economic asset (primarily valuable for its capacity to be owned, traded, developed, or used for intensive agricultural or industrial output). This economic framing tends to prioritize land's utilitarian functions (productivity, market value, infrastructure potential) while treating cultural, spiritual, and social dimensions as secondary or symbolic (Nche & Michael, 2024). Under this paradigm, sustainability strategies center on technical soil management, crop maximization, market-oriented planning, and economic valuation of ecosystem services, frequently ignoring embedded human-land relations that have historically shaped environmental resilience in many African societies.

Indigenous African environmental thought disrupts this reductionist framing by elaborating land as a multidimensional entity (simultaneously sacred, ecological, communal, ancestral, and interdependent with social life). These dimensions are not abstract; they are operationalized through specific traditional systems and practices that guide everyday ecological interaction. At the heart of these systems is a worldview in which humans are not external managers of an abstract "environment," but participants in a reciprocal ecological relationship embedded within cosmological, moral, and social orders (Nche & Michael, 2024).

One of the most documented traditional land-related practices is the institution of sacred groves (forests or forest patches protected through intergenerational beliefs, taboos, and spiritual prohibitions). Sacred groves are defined as patches of forest left undisturbed by humans because they are believed to be inhabited by ancestors, spirits, or deities whose continued presence ensures ecological balance and social well-being (Sinthumule, 2024). In Southeast Nigeria, sacred groves tied to totemic plant species such as *Cola acuminata*, *Milicia excelsa*, and *Elaeis guineensis* are actively conserved by Igbo communities through customary prohibitions on cutting or clearing (Nwafor et al., 2026). Research in Southwest Nigeria demonstrates that such groves serve as biodiversity reservoirs, preserving rare and endemic species precisely because cultural norms restrict extraction and access (Adeyanju et al., 2022). Across West and East Africa, sacred groves have likewise been shown to sustain plant species diversity, protect water catchments, serve as refugia for wildlife, and act as fire refuges, intertwining spiritual belief with ecological function (Virtanen, 2002; Sinthumule, 2024).

Another enduring indigenous land-water practice is the Zai pit system, a soil-restoration and water-harvesting technique used across the Sahel, particularly in Burkina Faso, Niger, and northern Ghana (Roose, Kabore & Guenat, 1999; Danjuma & Mohammed, 2015). Zai pits are small, circular depressions dug into degraded soils and filled with organic matter to concentrate water and nutrients where plants grow. This counters soil erosion and improves soil structure in arid and semi-arid environments. Zai has been recognized as an indigenous strategy for restoration of degraded lands, increasing crop yields while enhancing soil fertility and water retention without chemical inputs (Roose et al., 1999; Danjuma & Mohammed, 2015). Its long history and adaptive use exemplify how indigenous African agriculture integrates ecological rehabilitation with sustainable food production in harsh climates.

Water management also reflects deeply rooted indigenous systems that combine technical know-how with moral and communal governance. In southern Ethiopia, the Borana and Konso communities have long

practised traditional water source protection systems (Ella wells and Harta ponds) managed over centuries through community norms that enforce equitable access, local enforcement, and spiritual respect for water's life-giving properties (Behailu, Pietilä & Katko, 2016). These systems embed principles of ownership, equity, integrity, and unity within water governance, demonstrating forms of sustainability that predate formal water institutions (Behailu et al., 2016). Traditional water management also entails deliberate protection of springs and wells through ritual respect and customary law, illustrating how spiritual and hydraulic knowledge combine to ensure long-term water availability.

Indigenous pastoral communities further illuminate how land thought is inseparable from ecological adaptation and animal husbandry. Detailed ethnographic research among pastoral groups such as the Kenyan Pokot and Namibian Himba reveals that their pastoral strategies are grounded in fine-grained ecological knowledge of species grazing values, plant succession, and savanna ecosystem dynamics (Bollig & Schulte, 1999). Such pastoral systems challenge stereotypical narratives of overgrazing, showing instead that rotational grazing, mobility, and contextual understanding of pasture dynamics sustain rangeland health. These strategies reflect ecological stewardship embedded in cultural identity, emphasizing adaptive use of land rather than exploitative extraction (Bollig & Schulte, 1999).

Forest conservation practices among the Ashanti of Ghana capture yet another dimension of indigenous environmental thought. Here, communities have historically used cultural rituals, clan-based prohibitions, and sacred shrines within forests to maintain forest integrity. These practices are linked to clan histories and spiritual meanings attached to specific trees and forest areas, which are managed not through formal policy instruments but through cultural belief and customary authority structures (Asante, Ababio & Boadu, 2017). The conservation benefits of such practices are evident in slowed forest loss and continued presence of old-growth trees in community forests under customary protection.

Across sub-Saharan Africa, research identifies a shared theme: indigenous practices of ecological stewardship emerge from knowledge systems in which land is not inert, but a life-bearing, socially embedded, and morally respected entity. These traditions encompass sacred spaces (sacred groves), soil and water conservation (Zai pits; traditional ponds and wells), adaptive grazing systems, and forest guardianship through spiritual customs (Nche & Michael, 2024; Behailu et al., 2016; Roose et al., 1999). Underlying these techniques are principles of reciprocity, respect, balance, and long-term orientation (values that inform practices that sustain biodiversity, protect soil and water, and configure land use around ecological equilibrium).

Importantly, these indigenous systems also embed governance practices. Customary authorities, elder councils, and community assemblies have long functioned as environmental regulators, applying customary law to protect sacred groves, monitor land use, enforce water sharing rules, and sustain pastoral mobility patterns (Schwaiger et al., 2024). Thus, ecological stewardship in many African contexts is neither accidental nor spontaneous; it is structurally integrated into moral, spiritual, and legal orders that predate and often outperform formal environmental institutions in conservation outcomes.

From the foregoing, Indigenous African Environmental Thought reframes land as a sacred ecological matrix (one that sustains human life, embodies ancestral connection, and orchestrates human–nature relationships through culturally grounded practices such as sacred groves, Zai pits, traditional water wells, and pastoral governance systems). These practices are not relics but active, empirically effective strategies for ecological resilience. Their continued relevance has implications not only for understanding sustainability in African contexts but for designing environmental policies that value cultural logic as a core component of ecological knowledge.

5.0 ECOLOGY, PLANNING, AND HUMAN FLOURISHING

Mainstream environmental planning and development scholarship frequently assumes that ecology, human settlement, and human flourishing are separate domains — the former residing in the science of ecosystems, the second in the technocratic discipline of planning, and the third in economics or public health. Conventional approaches posit ecological constraints as externalities to be managed, urban settlements as engines of economic growth, and human flourishing as a measurable outcome in terms of income, health, or literacy (Bonnett, 2002). Implicit in this thinking is the assumption that sustainability can be achieved primarily through scientific planning, engineered infrastructure, and economic optimization, without systemic attention to underlying cultural, moral, or spiritual knowledge systems. Ecology is treated as an “environmental problem,” planning as a technical exercise, and flourishing as a target to be hit by optimizing standardized indicators (Smitsman et al., 2014; Alokwa & Ezenwaji, 2015).

However, critical examinations of indigenous African systems reveal that human settlement patterns, agricultural practices, natural resource governance, and community well-being are deeply interwoven — and that this entanglement has ecological, ethical, and material consequences for sustainability. In many African traditions, planning is never simply about zoning and infrastructure; it is also about negotiating ecological relations, communal obligations, and moral orders that bind humans to land, water, forests, livestock, and ancestors. This relational conception is neither incidental nor nostalgic: it has produced a coherent set of adaptive social-ecological systems capable of sustaining complex landscapes long before modern sustainability frameworks emerged.

One of the most documented indigenous systems illustrating this integration is the sacred grove networks found across West and Central Africa. In Ashanti and Yoruba landscapes, sacred groves — protected patches of forest tied to particular deities, ancestors, or clan histories — serve simultaneously as repositories of biodiversity and as social-ecological governance institutions (Virtanen, 2002; Asante et al., 2017). Protected through ritual edicts and taboo-based sanctions, these groves function as gene banks for indigenous tree species, microhabitats for understory plants, and watershed stabilizers (Asante et al., 2017). The community norm against cutting trees in sacred groves is not a symbolic add-on; it materially prevents deforestation and maintains ecological functions, while the religious framing mobilizes social accountability (Sinthumule, 2024).

Similarly, water governance systems among the Borana in southern Ethiopia illustrate how indigenous planning intertwines ecology and community flourishing. Borana communities have traditionally managed *ella* wells and ponds (*harta*) through complex social institutions that allocate access equitably, monitor usage, and embed spiritual respect for water as a life-sustaining entity (Behailu et al., 2016). Rather than treating water as a resource to be rationed by market mechanisms or formal bureaucracies, this system synchronizes water use with seasonal cycles, herd movements, and inter-community diplomacy. Water governance is thus ecological, social, and moral simultaneously — a planning logic that aligns soil moisture, livestock needs, human use, and seasonal variation.

Indigenous agricultural planning practices also reveal this integration of ecology and ethical governance. The Zai pit system used across the Sahel demonstrates how soil conservation, water harvesting, and food security are co-constitutive. Farmers dig small pits, fill them with organic matter, and concentrate rainwater and nutrients to rehabilitate degraded soil — a practice that is neither purely technical nor unstructured, but rooted in local ecological observation and iterative adaptation (Roose et al., 1999). Zai pits increase crop yields and enhance resilience in semi-arid conditions precisely because they respond to spatial variability in rainfall and soil texture — this is planning grounded in ecological feedback loops rather than exogenous engineering plans.

Pastoral governance among Maasai and other pastoral groups likewise reveals sophisticated planning logic in ecological terms. Contrary to narratives of overgrazing, ethnographic evidence shows that pastoral communities use grazing rotation systems and mobility strategies to sustain rangeland health and livestock productivity (Bollig & Schulte, 1999). These systems depend on intimate ecological knowledge of forage cycles, seasonal water availability, and landscape heterogeneity. Grazing rotation is not merely a cultural preference but a landscape planning strategy that balances animal pressure with grassland recovery, embedding ecological stewardship in livestock management.

Built environments in many African contexts also reflect ecological intelligence. Hausa earth houses and thatched roof compounds in Nigeria, for instance, are not architectural atavisms but climate-responsive design choices that naturally regulate temperature and reduce dependence on energy-intensive cooling systems (Mabogunje, 2008). Mud walls, thick earthen insulation, courtyard orientation, and locally sourced materials are components of an indigenous planning philosophy that foregrounds environmental fit and human comfort without technological externalities. These structures embody what architectural scholars call vernacular environmental design — planning that arises from long-term engagement with local climate, material availability, and cultural norms (Mabogunje, 2008).

Crucially, these examples indicate that in African contexts, human flourishing is always ecological. In indigenous systems, well-being is not measured only by material criteria; it is realized through ecological integrity, social cohesion, cultural continuity, and moral encounter with the non-human world. Among the Akan and Yoruba, farming cycles (including crop rotation, intercropping, and fallowing) are informed by seasonal rituals, ancestor veneration, and taboos that regulate land use (Okediji, 2025). These practices support soil health and food security while reinforcing communal obligations and intergenerational ties.

This body of indigenous environmental thought reveals that separating ecology, planning, and human flourishing is both epistemically and practically limiting. Where ecology is treated as an external constraint, planning as a technical exercise, and flourishing as an economic outcome, policies risk overlooking the moral regulation, collective responsibility, and cultural embeddedness that sustain long-term ecological balance. Indigenous African settlements and their associated knowledge systems show that well-being extends beyond individual optimization to include the health of ecosystems, the vitality of community institutions, and the resilience of cultural norms (Nche & Michael, 2024).

Reconceptualizing planning as moral-ecological praxis means acknowledging that spatial arrangements, agricultural systems, water management, built environments, and social rituals co-produce conditions for both ecological resilience and human flourishing. It means recognizing that ecosystems are embedded in cultural frameworks, moral economies, and relational ethics (not just biophysical processes). Human flourishing, therefore, emerges from the interplay of ecological integrity, ethical governance, and culturally embedded practices, and not merely from the optimization of economic metrics. Indigenous African ecological planning systems are thus not relics of the past; they are epistemically valid models that offer robust alternatives for integrated sustainability practice and theory in contemporary discourse.

6.0 IMPLICATIONS FOR ENVIRONMENTAL EDUCATION AND PLANNING: A NIGERIAN CASE STUDY

The implications of indigenous African environmental thought for Nigeria are significant because they challenge the dominant pattern by which environmental education and planning are often framed. In many formal educational and policy spaces, environmental sustainability is still largely taught as an imported technical discourse: climate change, conservation, resource efficiency, pollution control, and urban planning are frequently presented through external theories, global indicators, scientific models, and

institutional policy language. While these tools are useful, they become inadequate when they are detached from the ecological histories, moral codes, indigenous technologies, and community practices through which Nigerian societies historically managed land, water, food systems, forests, settlements, and communal well-being. If sustainability is taught only as a modern scientific doctrine, learners may come to see environmental responsibility as something introduced from outside rather than as something already present within African knowledge systems (Bonnett, 2002; Eyong, 2004).

For Nigeria, therefore, environmental education must move beyond the simple transfer of global sustainability theories and become a process of ecological recovery. Such recovery does not mean romanticising the past or rejecting modern science. Rather, it requires placing indigenous ecological pedagogy beside scientific knowledge as a valid source of environmental reasoning. Indigenous knowledge systems are not merely informal practices; they are tested systems of observation, adaptation, restraint, and moral regulation. Practices such as sacred grove protection, shifting cultivation, intercropping, fallowing, manure use, seed preservation, water-source protection, and climate-responsive architecture show that indigenous communities possessed practical systems for sustaining ecological balance and human welfare (Alokwu & Ezenwaji, 2015; Alokwu, 2009). Environmental education in Nigeria should therefore teach sustainability not only as a subject of climate science but also as a history of local environmental intelligence.

One direct implication is curricular reform. Nigerian environmental education should include region-specific indigenous practices as legitimate learning content. In the South-West, for instance, sacred grove traditions and Yoruba land-use practices can be used to teach biodiversity conservation, forest ethics, water protection, and taboo-based environmental regulation. Sacred groves are especially important because they demonstrate how spiritual authority, communal memory, and ecological preservation can work together. Rather than presenting such groves as superstition, environmental education should interpret them as community-based conservation institutions that preserved trees, species, water catchments, and habitats through moral restraint and social enforcement (Virtanen, 2002; Adeyanju et al., 2022; Sinthumule, 2024). In the South-East, Igbo sacred landscapes, totemic plant protection, communal land ethics, and the apprenticeship logic of intergenerational responsibility can be used to teach the relationship between ecology, livelihood, and social continuity (Nche & Michael, 2024). In the North, Hausa earth architecture, courtyard planning, ridge tillage, dryland water harvesting, and Sahelian Zai-type pit systems can be used to teach climate-responsive design, soil restoration, water retention, and low-external-input agriculture (Roose et al., 1999; Danjuma & Mohammed, 2015; Mabogunje, 2008).

A second implication concerns pedagogy. Environmental education should not be limited to classroom instruction, textbooks, and abstract definitions. Indigenous ecological knowledge is learned through observation, participation, demonstration, storytelling, apprenticeship, and community practice. This means that Nigerian schools and universities should adopt field-based learning models where students study farms, sacred groves, local water systems, markets, earth buildings, community forests, and traditional farming sites. Elders, farmers, herbalists, builders, pastoralists, fishers, and local custodians of sacred spaces should be engaged as knowledge bearers. This would correct the colonial tendency to treat only formally certified experts as legitimate producers of knowledge. It would also help students see that ecological wisdom is not only found in laboratories and policy documents but also in the lived practices of communities (Eyong, 2003; Eyong et al., 2004).

Third, environmental planning in Nigeria should become more participatory and culturally grounded. Current planning systems often prioritise technical maps, land-use zoning, infrastructure expansion, and economic valuation. While these are necessary, they may fail when they ignore the cultural meanings attached to land and natural resources. A decolonised planning model would require planners to identify

sacred forests, ancestral lands, communal water points, traditional grazing routes, seasonal farming zones, and culturally protected trees before designing interventions. Such a model would treat indigenous environmental knowledge as planning data, not as folklore. It would also prevent the disruption of ecological spaces that communities already protect through customary systems. Planning that ignores these meanings can destroy not only ecological sites but also the moral institutions that regulate sustainable behaviour (Alokwa & Ezenwaji, 2015; Alokwa & Ezenwaji, 2015).

Fourth, Nigeria's environmental planning must take indigenous architecture seriously. In many Nigerian cities, development is often equated with concrete expansion, glass buildings, imported materials, and energy-intensive cooling systems. Yet Hausa earth homes, mud walls, thatched roofing, shaded courtyards, and compound layouts show a tradition of climate-responsive design. These systems reduce heat, encourage ventilation, use local materials, and work with the environment rather than against it. Planning education should therefore teach vernacular architecture as environmental technology. Urban planners, architects, and building regulators should study how indigenous forms of housing achieved thermal comfort, low material toxicity, and ecological fit before the widespread dependence on artificial cooling and imported building materials (Mabogunje, 2008).

Fifth, agricultural education and rural planning should prioritise low-external-input systems. Many Nigerian smallholder farmers already rely on manure, composting, mixed cropping, seed selection, intercropping, fallowing, crop rotation, and farmer-to-farmer knowledge exchange. These practices should be strengthened through research and extension rather than displaced by total dependence on expensive external inputs. The implication is that agricultural colleges and extension services should begin from what farmers already know and do. Indigenous practices should be tested, documented, refined, and improved through collaboration, not dismissed as backward. This creates a more democratic agricultural knowledge system, where farmers are not passive recipients of expert advice but co-producers of ecological knowledge (Šūmane, et al 2018).

Finally, the Nigerian case shows that environmental education must be linked to human flourishing. If flourishing is understood only as income growth, infrastructure expansion, or urban modernisation, then sustainability will remain incomplete. Indigenous African thought suggests that flourishing includes healthy soil, protected water, meaningful community life, cultural continuity, moral responsibility, food security, spiritual belonging, and intergenerational justice. Education and planning should therefore cultivate citizens who understand that environmental destruction is not merely a technical problem but a breakdown of relationship: relationship with land, community, ancestors, future generations, and non-human life. A Nigerian sustainability curriculum shaped by this insight would produce not only environmentally informed students but morally responsive ecological citizens.

Thus, the central implication is that Nigeria must decolonise environmental education and planning by recovering indigenous ecological pedagogy and integrating it with contemporary scientific knowledge. The goal is not to replace science with tradition, but to create a richer framework in which sacred groves, Zai pits, earth architecture, communal water systems, seed preservation, intercropping, pastoral knowledge, and customary governance become part of formal sustainability thinking. Such an approach would make environmental education more culturally meaningful, planning more community-responsive, and sustainability more rooted in the lived realities of Nigerian society.

7.0 CONCLUSION AND RECOMMENDATIONS

This paper has argued that environmental sustainability in Africa, and Nigeria in particular, cannot be adequately understood through imported technocratic models alone. While modern sustainability discourse

often presents ecology, planning, and human well-being as separate domains, indigenous African thought reveals a more integrated framework in which land, water, forests, settlements, agriculture, spirituality, and communal life are mutually connected. Practices such as sacred grove protection, shifting cultivation, intercropping, fallowing, seed preservation, manure use, earth architecture, water-source protection, and communal land ethics show that African societies historically developed sustainable systems before sustainability became a global policy language (Eyong, 2004; Alokwu & Ezenwaji, 2015).

The central contribution of this paper is that decolonising environmental sustainability does not mean rejecting science. Rather, it means correcting the epistemic imbalance that treats indigenous ecological knowledge as inferior, informal, or merely cultural. A more adequate sustainability framework for Nigeria must recognise indigenous knowledge systems as sources of theory, pedagogy, and planning practice. When integrated with contemporary science, these systems can support ecological resilience, cultural continuity, community participation, and human flourishing.

Recommendations

- Integrate indigenous ecological knowledge into Nigerian curricula. Environmental education should include sacred groves, Zai-type water harvesting, intercropping, seed preservation, earth architecture, and communal resource governance as legitimate sustainability knowledge.
- Adopt community-based environmental pedagogy. Schools and universities should use field visits, oral history, elder interviews, farm observation, and sacred-site studies to connect classroom learning with lived ecological practices.
- Recognise traditional custodians as knowledge partners. Elders, farmers, pastoralists, herbalists, builders, and custodians of sacred spaces should be involved in environmental education, planning consultations, and local sustainability projects.
- Reform planning practice to include cultural-ecological mapping. Before land-use decisions are made, planners should identify sacred forests, ancestral lands, traditional water points, grazing routes, protected trees, and indigenous farming zones.
- Promote climate-responsive indigenous architecture. Nigerian planning and architecture programmes should study Hausa earth homes, mud walls, courtyards, thatched roofs, and other vernacular designs as sustainable building technologies.
- Support low-external-input agriculture. Agricultural policy should strengthen manure use, composting, mixed cropping, fallowing, crop rotation, local seed systems, and farmer-to-farmer knowledge exchange instead of overdependence on imported inputs.
- Create indigenous knowledge documentation centres. Nigeria should support local archives that preserve ecological practices, oral traditions, seed knowledge, medicinal plant knowledge, water practices, and community conservation systems.
- Use indigenous knowledge alongside modern science. The goal should not be replacement but integration, where scientific tools and African ecological wisdom jointly shape environmental education, planning, and sustainability policy.

REFERENCES

- Adeyanju, S. O., Bulkan, J., Onyekwelu, J. C., Peterson St-Laurent, G., Kozak, R., Sunderland, T., & Stimm, B. (2022). Drivers of biodiversity conservation in sacred groves: A comparative study of three sacred groves in Southwest Nigeria. *International Journal of the Commons*, 16(1), 94–107. <https://doi.org/10.5334/ijc.1143>
- Alokwu, C. O. (2009). *The Anglican Church, environment and poverty: Constructing a Nigerian indigenous oikotheology* [Doctoral dissertation, University of KwaZulu-Natal].
- Alokwu, C. O., & Ezenwaji, E. E. (2015). African indigenous knowledge system and environmental sustainability. *International Journal of Environmental Protection and Policy*, 3(4), 88–96. <https://doi.org/10.11648/j.ijepp.20150304.12>
- Asante, E. A., Ababio, S., & Boadu, K. B. (2017). The use of indigenous cultural practices by the Ashantis for the conservation of forests in Ghana. *SAGE Open*, 7(1), 1–7. <https://doi.org/10.1177/2158244016687611>
- Behailu, B. M., Pietilä, P. E., & Katko, T. S. (2016). Indigenous practices of water management for sustainable services: Case of Borana and Konso, Ethiopia. *SAGE Open*, 6(4), 1–11. <https://doi.org/10.1177/2158244016682292>
- Berkes, F. (1999). *Sacred ecology: Traditional ecological knowledge and resource management*. Taylor & Francis.
- Bonnett, M. (2002). Education for sustainability as a frame of mind. *Environmental Education Research*, 8(1), 9–20. <https://doi.org/10.1080/13504620120109619>
- Chibvongodze, D. T. (2016). Ubuntu is not only about the human! An analysis of the role of African philosophy and ethics in environment management. *Journal of Human ecology*, 53(2), 157–166.
- Danjuma, M. N., & Mohammed, S. (2015). Zai pits system: A catalyst for restoration in the dry lands. *Journal of Agriculture and Veterinary Science*, 8(2), 1–4.
- Eyong, C. T. (2007). Indigenous knowledge and sustainable development in Africa: Case study on Central Africa. In E. K. Boon & L. Hens (Eds.), *Indigenous knowledge systems and sustainable development: Relevance for Africa* (Tribes and Tribals Special Volume No. 1, pp. 121–139). Kamla-Raj Enterprises.
- Grenier, L. (1998). *Working with indigenous knowledge: A guide for researchers*. International Development Research Centre.
- Hope, J. (2020). Globalising sustainable development: Decolonial disruptions and environmental justice in Bolivia. *Area*, 54(2), 176–184. <https://doi.org/10.1111/area.12626>
- Mabogunje, A. L. (1968). *Urbanization in Nigeria*. University of London Press.
- Nche, G. C., & Michael, B. O. (2024). Perspectives on African indigenous religion and the natural environment: Beings, interconnectedness, communities and knowledge systems. *Phronimon*, 25, 1–26. <https://doi.org/10.25159/2413-3086/14621>
- Ndlovu-Gatsheni, S. (2018). The dynamics of epistemological decolonisation in the 21st century: Towards epistemic freedom. *The Strategic Review for Southern Africa*, 40(1).

- Nwafor, F. I., Njoku, E. U., Okuh-Ikeme, P. C., Amadi, C. C., Ozokolie, C. B., Nweze, A. E., & Oloto, C. (2026). Totems and sacred groves in Southeast Nigeria: Indigenous nature-based solutions for climate change mitigation and biodiversity conservation. *Frontiers in Ecology and Evolution*, 14, Article 1732469. <https://doi.org/10.3389/fevo.2026.1732469>
- Okediji, S. A. (2025). An Overview of Traditional Religious Practices and Indigenous Agricultural Methods in the Light of Modern Farming Techniques in Oyo-Yoruba of Nigeria. *Journal of Religions & Peace Studies*.
- Olaopa, O. R. (2025). African indigenous knowledge (AIK) for environmental management and sustainable development: The role of Yoruba epistemology. *Cogent Social Sciences*, 11(1), Article 2455775. <https://doi.org/10.1080/23311886.2025.2455775>
- Posey, D. A., & Dutfield, G. (1996). *Beyond intellectual property: Toward traditional resource rights for indigenous peoples and local communities*. International Development Research Centre.
- Roose, E., Kaboré, V., & Guenat, C. (1999). Zaï practice: A West African traditional rehabilitation system for semiarid degraded lands, a case study in Burkina Faso. *Arid Soil Research and Rehabilitation*, 13(4), 343–355. <https://doi.org/10.1080/089030699263230>
- Schwaiger, J., Tas Kronenburg, Z. M., Auch, A., Bosker, T., & Ehrhardt, D. (2024). Customary authorities and environmental governance in Africa: A systematic review. *Society & Natural Resources*. Advance online publication. <https://doi.org/10.1080/08941920.2024.2338781>
- Sinthumule, N. I. (2024). Sacred forests as repositories of local biodiversity in Africa: A systematic review. *Journal of Sustainable Forestry*. Advance online publication. <https://doi.org/10.1080/10549811.2024.2397522>
- Smitsman, A., Deenapanray, P. N. K., & Chung Kim Chung, G. (2014). The philosophical foundations of the Education for Sustainability Programme. *Studies in Applied Pedagogy*, 3(Special issue), 17–36.
- Šūmane, S., Kunda, I., Knickel, K., Strauss, A., Tisenkopfs, T., des Ios Rios, I., ... & Ashkenazy, A. (2018). Local and farmers' knowledge matters! How integrating informal and formal knowledge enhances sustainable and resilient agriculture. *Journal of Rural Studies*, 59, 232-241.
- Virtanen, P. (2002). The role of customary institutions in the conservation of biodiversity: Sacred forests in Mozambique. *Environmental Values*, 11(2), 227–241. <https://doi.org/10.3197/096327102129341073>
- Warren, D. M. (1992). Indigenous knowledge, biodiversity conservation and development [Keynote address]. *International Conference on Conservation of Biodiversity in Africa: Local Initiatives and Institutional Roles*, National Museums of Kenya, Nairobi, Kenya.