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Ecological Sustainability for "Life on Land": Wellspring of Indigenous Knowledge

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Abstract: This article argues that indigenous knowledge is significantly resourceful for ecological sustainability, without which humanity will not survive. It addresses the intersection between the 15th United Nations Sustainable Development Goal (SGD) "Life on Land" and African indigenous knowledge systems, including the fundamental support system that can sustain the livelihoods of communities. It reconstructs the vision of ecological sustainability from the indigenous knowledge perspective by first analyzing the inadequacy of the United Nations carbon-pricing approach to reforestation and conservation in developing countries. Then, it uses the *ethnosphere* methodological approach, affirming the ecological ethical warrants found in indigenous epistemology and cosmology in regard to land protection in dialogue with the sustainability vision of *Laudado Si'*, *Querida Amazonia*, and *Laudate Deum*. This article explores indigenous knowledge's wellspring for ecological sustainability and what it offers for a more sustainable "Life on Land". It suggests an approach to ecological sustainability that goes beyond a market-based instrument to CO_2 reduction to embrace a view of the "sacramental universe" as essential theological input, without which sustainable "Life on Land" cannot be met. It concludes by showing how African mountain region conservancy practices are not essential in sustaining "Life on Land" not solely because they provide the earth's freshwater but also because they contain valuable ecologically sensitive cultural and religious wisdom.

Keywords: indigenous knowledge; sacramental universe; Life on Land; ecological sustainability; cultural capital; ancestorhood; sacred spaces; ecological taboo; *ethnosphere*; African cosmology

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1. Introduction: Main Argument, Context, Scope, and Structure

> "Praise be to you, my Lord, through our Sister, Mother Earth, who sustains and governs us and produces various fruit with colored flowers and herbs" (Francis of Assisi 1225).

Scholars—Environmentalists, sociologists, and anthropologists—agree that Indigenous knowledge is gaining vital recognition within Western science. They provide compelling examples from scientific literature illustrating how indigenous wisdom has profoundly enriched our understanding of ecology, evolution, physiology, and applied ecology. (Jessen et al. 2022, pp. 93–94) This integration not only broadens the scientific landscape but also honors the invaluable contributions of Indigenous cultures to the world of knowledge and development.

Sustainable Development Goal 15 (SDG) "Life on Land" requires us to "sustainably manage forests, combat desertification, halt and reverse land degradation, halt biodiversity loss" (United Nations 2024b). I argue that indigenous wisdom is fundamental for a sustainable "Life on land," which is, in turn, vital to human and non-human flourishing.

To bolster Sustainable Development Goals (SDGs), scientific-oriented land use approaches that rely on geoscientific principles and carbon pricing methods must work hand-in-hand with local African indigenous epistemologies that emphasize the idea of "'sacramental universe' to indicate a new or renewed relationship between the human community and the earth." (Mealy 2015, p. 182)—a comprehensive view of creation, including the spiritual, whereby one interprets the meaning of "Life on Land" from a broader understanding of what the reality called "life" encompasses. Scientific Environmental conservation methods and policies are not the only means to true knowledge about sustainable development. The latter needs indigenous knowledge (IK) and initiatives, indispensable for participatory development, without which sustainable development cannot be met. IK can fill the gaps in the UN SDG "Life on Land".

The idea of a "sacramental universe" implies a shift in method, adding a more relational model of understanding the interconnectivity of humans and the entire ecosystem to scientific ecological paradigms (Mealy 2015, p. 182). It encompasses what Enrique Salmón call the Rarámuri, southern Mexican and pre-Columbian view of the universe: "when humans view their surroundings as kin; that their mutual roles are essential for their survival" (Salmón 2000, p. 1327). The natural world constitutes our relatives in a real sense.

The concept of a "sacramental universe" highlights the presence of the divine in our midst, acknowledging that God is actively involved in all matters. We, human beings, are merely a small part of the universe. "Sacramental universe" considers the "cultures of immanence", which deserve to be studied on their own merits rather than solely through the lens of a transcendent God beyond us (Sahlins 2023). A genuine sustainable "Life on Land" must embrace the "sacramental universe" framework. Diverse critical epistemologies need to be put in dialogue to address biodiversity loss.

There has been a lot of thinking among anthropologists in recent years about how indigenous knowledge should be vetted. Drawing on IK does not claim indigenous communities live up fully to the ecological ideal of the "sacramental universe" or that they perfectly embrace a broader view of creation as embodying the sacred and the profane. A critical examination of IK must consider how it strives to embrace the vision of the "sacramental universe", which I affirm is resourceful for sustainable development and should be considered in international sustainable "Life on Land" strategies.

The *ethnosphere* method supports my reference to the IK as resourceful for sustainable "Life on Land". Orobator understands *ethnosphere* as a method that looks "beyond the material, scientific, and technical realms to deeper sources of ethical warrants and spiritual rationale for environmental sustainability and ecological harmony" (Orobator 2018, p. 112). *Ethnosphere* allows the use of the African indigenous practices revolving around the epistemological and cosmological dimensions in which they operate in their relationships to forests. I take forests as one concrete component of land. My approach to "Life on Land" is twofold: "Life on Land" is to be sustainable for indigenous peoples and the earth's integrity. This *ethnosphere* approach draws on cultural anthropology, which is "uniquely equipped to engage humanity in all its diversity" (Raverty 2014, p. 37) and relationships. Thus, I consider the relational and interconnectedness dimensions in indigenous knowledge as they stress the integration of humans with all created order. For indigenous peoples, "Life on land" follows a "kincentric ecology", by which humans see everything around them in terms of relationships, shares of kinship, or as part of an "extended ecological family" (Salmón 2000, pp. 1327–32), as stressed by Pope Francis, "human life is incomprehensible and unsustainable without other creatures"[1]. "*Kincentric ecology* sustains the idea that "environmental vices do not just harm nature; they harm us and the people around us." (Sandler and Cafaro 2005, p. 153) This vision of the world is resourceful to the sustainability of land.

The article will be enfolded into three sections. First, it discusses the strengths and limitations of the UN approach to sustainable "Life on Land" to expand on the context in which the above-introduced problem arises. I will not develop all UN mechanisms but only those that apply to the Congo Basin and the Amazon forests.

Second, I will enfold my arguments in two sections: (1) a discussion of the relevance of the *ethnosphere* method for African indigenous systems analysis—which includes knowledge and epistemological processes or indigenous ways of knowing—and a definition of the main relevant concepts. Then, (2) in a third section, a theological argumentation of the African indigenous Knowledge (AIK) and its support for a sustainable "Life on Land". I will approach "African indigenous knowledge in the form of the common features shared by the indigenous communities of Africa: lived spaces, concepts, ideologies, methodologies, and identities [pointing to the interconnectedness of the African religion] that offer potential" (Musili 2024, p. 4) sustainable avenues for responding to the ecological crisis that "Life on Land" suffers. I will examine how these elements interrogate the UN Carbon-market approach.

The third section will also enhance what sociologists call "cultural capital"—"resources based on forms of knowledge, education, and skills available to members of groups of people" (Mawere and Awuah-Nyamekye 2015). In "cultural capital", I include examples of the attributes of AIK, including food security systems that enable sustainable land preservation. Finally, I will conclude by recovering how embracing the "sacramental universe" does support the UN's claim that mountain regions are critical in promoting sustainability and how indigenous cultural and religious wisdom is essential for nurturing biodiversity on land, making it invaluable for our planet's health and future.

2. Analysis of the UN Sustainable Development Goal (SDG) "Life on Land": Ecological Sustainability Issues

The notion of sustainable development transcends the role of economic growth to sustain the entire planet for many years and future generations. While economic growth is crucial, it's not the sole solution. Catholic teaching has long stressed the latter claim, warning developed countries to avoid aid of development that are imperialist and ignore the experiences of recipient countries, and no aid shall lead to a new form of colonialism.[2] *Populorum Progressio* insisted that development does not focus merely on economic development but promotes every person and the whole person.[3] They have underlined that the religious dimensions shall not be overlooked in the quest for authentic and integral development. For the popes it was always clear that development in Global South ought not to be equated with the myth of progress of the West. John Paul II always counted the cultural and spiritual dimensions of development,[4] among other things, because the coexistence of high productivity and widespread poverty seriously threatens the environment. Pope Francis insists that "We can no longer speak of sustainable development apart from intergenerational solidarity." [5] He reminds us that sustainable development necessitates managing economic growth by establishing reasonable limits.[6] It is clear that for Pope Francis, "people cannot flourish unless the planet also flourishes" (Annett 2022, p. 125). I add that genuine sustainable development hinges on reducing economic dependence, especially for basic needs. This, in turn, requires harnessing endogenous knowledge and resources to thrive harmoniously with our environment, communities, and those beyond us.

Sustainable development is "the ability to meet individual's needs in the current world while protecting sufficient resources to allow future generations to meet their own needs" (Mealy 2015, p. 1). As the 1987 Brundtland Report suggests, sustainable development requires us to see how "[m]uch of the economic growth pulls raw material from forests, soils, seas, and waterways" (Brundtland Commission 1987d, para. 13). [See M11]

It pushes us to see the interdependence between ecology and economy in new, sustainable ways (Brundtland Commission 1987d, para. 15) [See M12]. It "requires views of human needs and well-being that incorporate such non-economic variables as education and health[. . .], clean air and water, and the protection of natural beauty" (Brundtland Commission 1987b, para. 39) [See M13]. Sustainable development needs the indigenous cosmological "eco-friendly attributes" (Okonkwo 2011). Paths to sustainable development shall not compartmentalize crises; they should consider environmental, development, energy, food crises, etc., as one.

The UN's Sustainable Development Goals (SDGs) for 2030 emphasize land protection and have acknowledged the relevance of local wisdom but have yet to integrate indigenous cosmologies and epistemologies in their strategic vision and responses. The UN SDG "Life on Land" is noble as it means combating desertification, restoring degraded land and soil, and achieving a neutral world regarding land degradation. It aims to preserve mountain ecosystems and their biodiversity to provide essential benefits for development (UNDP 2024). This implies mobilizing significant resources to support sustainable forest management and provide incentives for conservation and reforestation in developing countries. For "Around 1.6 billion people depend on forests for their livelihoods. Forests are home for more than 80 percent of all terrestrial species of animals, plants and insects. 2.6 billion people depend directly on agriculture for a living. 33 percent nature-based climate solutions can contribute about a third of CO2 reduction by 2030. . .Mountain regions provide 68–80 percent of the earth's fresh water" (UNDP 2024). This goal would benefit more from the IK of land protection.

However, United Nations Climate Change Program has embraced the carbon pricing approaches. The latter implies that a carbon price "reduces emissions and the costs associated with these emissions". The UN recognizes it as the most effective, straightforward, and simplest way to reduce Greenhouse Gas Emissions (GHE). Carbon prices are meant to reach "Nationally Determined Contributions (NDCs)" (United Nations 2023), reducing investors' emissions. Its laudable goal is to keep the economic growth up while reducing its consequent greenhouse emissions, taxing the bad polluters to create revenues. However, Pope Francis, economists, and policymakers disagree on whether "the best method for reducing carbon emissions is through a pricing tax or a market mechanism" (Whitehead 2015). For Jean Tirole, the French 2014 Nobel Prize laureate in Economics, as for Pope Francis, consumerism is the real issue. Like Pope Francis, who reminds us we have not done enough (*Laudato Deum*), Tirole is worried because "[s]imply making promises isn't enough;" we still need to carry out these promises (Whitehead 2015). I add that the real problem is the lack of a sacramental view of the universe perceived in many indigenous views can make a difference.

United Nations Climate Change affirms that "[c]arbon pricing delivers substantial benefits against the UN's SGGs (United Nations 2023, p. 25) and achieves social impact and economic objectives such as poverty alleviation, raising revenues for investments (United Nations 2023, p. 19). The UN evaluates the benefits of carbon pricing as promoting "[t]he achievement of SDGs [Sustainable Development Goals] by channeling financing to SD [Sustainable Development] projects", including ensuring visible benefits on the 15th Development goal: "Life on Land" (United Nations 2023, pp. 24–25).

Tirole believes these market mechanisms could be more efficient, but Pope Francis is more skeptical about their effectiveness in tackling climate change and improving people's lives, especially the poor communities most affected by global warming. *Reducing Emissions from Deforestation and Forest Degradation* (REDD+) is one of the United Nations responses set up to contribute to climate change mitigation efforts. REDD+ is part of a vision called Green Economy, which has promising prospects. However, environmental scholars and activists

believe the primary aim of REDD+ "is to offset emissions and not to bring about pro-poor development" (Luttrell et al. 2007). For the World Rainforest Movement (WRM), it is "a tactic used to 'clean up' the image of corporations rather than address corporate capture and capitalism as the true drivers of deforestation. . . these 'solutions' support corporate-driven destruction that is causing a deep social and ecological crisis" (World Rainforest Movement (WRM) 2023). Carbon plantations like REDD+ have been long criticized for their technological and market-based instruments as "false solutions for climate, energy crises, and for communities" (World Rainforest Movement (WRM) 2017). Their approach tends "to reinforce historical injustices of land allocation" (World Rainforest Movement (WRM) 2017). The "customary land" (World Rainforest Movement (WRM) 2017) indigenous people used to access tends to be turned into "privately-held property" (World Rainforest Movement (WRM) 2017) by these mechanisms which expel or marginalize "the indigenous peoples, the river people and those of African descent", and which "are provoking a cry that rises up to heaven".[7]

3. One-Fits-All Mechanisms to Climate Change Mitigation: Ethical Issues

The international community's approach to sustainable development applies these mechanisms in their responses to conserving forests in the Congo Basin and the Amazonian forests. These include BioCarbon Fund projects like the *Plantar* in Brazil, the *Ibi Batéké* in the Democratic Republic of Congo (DRC). These responses have been assessed as a one-fits-all to climate change mitigation, treating conservation as a monetary issue, and have been severely criticized by movements that support local communities and indigenous peoples' struggles for forest conservation.

Amid the hype surrounding investments in carbon markets, a recent study by WRM has delved into a REDD+ initiative projects in the municipality of Portel, in the state of Pará in the Brazilian Amazon, which vividly illustrates and strongly denounces what is known as 'carbon colonialism.' (World Rainforest Movement (WRM) 2023). These projects are changing the Brazilian indigenous customary lands systems to new "landowners" of REDD+ projects, creating land conflicts (World Rainforest Movement (WRM) 2022). The DRC's case is the most illustrative of these conflicts. According to Milburn, REDD+ provides the DRC "the potential to earn US$1 billion from carbon markets" through the Ibi Batéké Carbon Sink Plantation (IBCSP) project alone (Milburn 2014, p. 880), known as the first "Clean Development Mechanism (CDM)" in DRC. This is a Mai Ndombe REDD+ project (a Central West province of the DRC) financed by the World Bank.[8] It is a 30-year lifetime "carbon finance project", a "tree planting project [which] promised to use loans and up-front carbon payments to plant acacia, eucalyptus, and pine trees on ca. 4000 hectares of savannah and restore 230 hectares as "ecological area" through the planting of native tree species" (Milburn 2014, pp. 871–87). The Ibi Bateke might be one of the cases for which we should reject "activities that are financially attractive in the short run" (Brundtland Commission 1987e, para. 40) (See M14) as no sustainable. The Ibi Bateke and others elsewhere are not "setting aside sufficient funding to replant the acacia trees" once the funding is cut off. It exceeds $90 million for an area of 12.3 million hectares, representing 123,000 km^2 (approximately the size of England), of which 9.8 million hectares are forests (Gauthier 2018). However, the more significant the money invested, the more conflicts are fueled in this region. It was sold as a success, but it was not. As Pope Francis reminds,

> When certain businesses out for quick profit appropriate lands and end up privatizing even potable water, or when local authorities give free access to timber companies, mining or oil projects, and other businesses that raze the forests and pollute the environment, economic relationships are unduly altered and become an instrument of death. [9]

The carbon pricing and market mechanisms emphasize the physical and economic but overlook the socio-cultural and religious dimensions. Though the 15th United Nations SDG "Life on Land" acknowledges the need to deepen our views of the land; it claims that "[w]e need to shift humanity's relationship with nature to achieve SDG 15 and realize that nature is the root of our life on earth" (United Nations 2024a). An *ethnosphere* approach is needed to grasp the resourceful indigenous systems to deepen the UN's views of the land.

The looming impact of climate change on the delicate balance between ecosystems and human interactions is alarming. It can disrupt these interactions, resulting in biodiversity loss and jeopardizing SDG 15, "Life on Land". Anthropologists and culture and heritage scholars Munyaradzi Mawere and Tapuwa R. Mubaya explain how African indigenous communities are suffering but also resisting these climate disruptions (Mawere and Mubaya 2015, pp. 116–17). Religious forces upon which cosmology is structured (Ioannis Kyriakakis 2012) are reliable in responding to the quest for sustainability.

Cosmology as "world, universe" refers to "a set of principles including cosmogony (how did the world begin), ontology (what does the world consist of), and an exegesis or a tendency for reproduction of life events through a universal pattern (how the world works)" (Ioannis Kyriakakis 2012, p. 6). Ionnis Kyriakakis adds that "Cosmology can thus be defined as a set of principles and mechanisms that regulate the world, both natural and social; these principles and mechanisms being constantly present and operative in everyday life" (Ioannis Kyriakakis 2012, p. 6). As Pope Francis states, "If we are truly concerned with developing an ecology capable of remedying the damage we have done [to the land], no branch of the sciences and no form of wisdom can be left out, and that includes religion and the language particular to it".[10] Still, cosmological and religious forces and languages seem overlooked in international approaches to SDGs. Thus, I call on embracing the sacramental universe in matters of land from the indigenous perspective.

Moreover, since "the environment is taken to mean the land, water, and vegetation assets that are utilized either directly or indirectly to provide means of survival for human populations" (Mawere 2013), a dialogue among the African indigenous, Christian visions of ecological survival, and the UN approaches is needed. Indeed, African religious wisdom and language are abundantly resourceful in ensuring the "conservation of mountain ecosystems" for a sustainable approach to development.

4. The "Sacramental Universe" in the Global Indigenous Communities

Who are the indigenous communities, and where do they live? They are communities whose livelihoods, identities, and cultures are deeply rooted in their native lands (Odchigue 2015). There are over 476 million Indigenous people globally, distributed across 90 countries and representing approximately 5000 unique cultures. They comprise 6.2 percent of the world's population across all geographic regions (Buchholz 2022). The UN twelfth session Forum of Indigenous Peoples/Indigenous Voices affirms that indigenous "traditional knowledge and the effective use and preservation of their lands and natural resources can inspire worldwide measures for conservation and mitigation, particularly in the face of climate change. Traditional medicines and practices can be shared for the benefit of the wider society" (United Nations 2013b). In percent of the total population worldwide the indigenous people represent 96% of the population of Samoa, 88.9% of Greenland, 80% of French Polynesia, 43.8 of Guatemala, 41.2 of New Caledonia, 41% of Bolivia, 36% of Nepal, 33% in Algeria, 33% in Laos, 28% Morocco, 25% of Kenya, 16.5% of New Zeland, 16% of Lybia, 15% of the Philippines, and 14.7 of Vietnam (Buchholz 2022).

The Rarámuri are not cited above but their cosmological view reflects well the vision of the "sacramental universe" in their kincentric ecological "*iwígara*"—"the total interconnectedness and integration of all life." (Salmón 2000, p. 1327). *Iwígara* "channels the idea

that all life, spiritual and physical, are interconnected in a continual cycle [. . .] The natural world, therefore, is not one of wonder, but of familiarity" (Salmón 2000, p. 1327). This view informs their medicinal and agricultural practices and has ethical implications for their lives (Salmón 2000, p. 1327). When one kin, member is threatened, it is the entire life that is threatened. The Rarámuri cosmology is centered on the idea that "*Onoruame,* [the Supreme Being] the creator and provider of corn (Zea mays) and life" (Salmón 2000, p. 1327).

Indigenous communities' experiential kincentric epistemologies help us grasp the moral and theological dimensions of their relation to the environment, which I argue are determinants for a sustainable "Life on land". Salmón illustrates this point when he refers to "Rarámuri homeland" as an indigenous biologically diverse region, managed by the indigenous community "for at least 2000 years". He argues that a region with "About 350 different plant species are used by the Rarámuri for food and medicine. Mestizo populations in the area recognize and use only about 40% of those used by the Rarámuri [...] These numbers reflect the strong relationship and connection the Rarámuri maintain with their environment" (Salmón 2000, p. 1329). Thus, the Rarámuri offers us a patent food security example. The ability of IK to foster a sustainable "Life on Land" should not be overlooked in international global policy-making. Examples of *food security*[11] systems in indigenous communities are illustrative of this claim.

The sacramental universe helps the IK find a sense of purpose turned into a divine "ordaining wisdom"[12] that is beyond the material world but fosters the ethical values related to what Anthony M. Annett[13] calls the three basic psychological needs that are fundamental to *eudaimonia*: "autonomy, competence, and relatedness" (Annett 2022). These eudemonic virtues are crucial to any sustainable "Life on land" and are well displayed in what can be affirmed as the Rarámuri food security system, above described by Salmón. This security results from their ways of knowing and "sacramental" vision of the universe.

5. Indigenous Epistemology and the Sacramental Universe

Nelson Chanza, quoting several authors, suggests several concepts for indigenous knowledge (IK) according to their varieties. The commonly used terms are IK and IKS; others include local knowledge, traditional ecological knowledge, traditional phonological knowledge, African indigenous climate knowledge, local ecological knowledge, and endogenous knowledge[14]. Chanza himself used the term "indigenous climate knowledge (ICK)"[15] and affirmed that all these concepts allude to the same meaning: "legitimate knowledge necessary for people to sustainably manage their environment in order to earn a living now and in the future [. . .]indigenous-based knowledge is capable of filling knowledge gaps and validating current understanding about climate change, particularly at local levels".[16] The knowledge that has helped indigenous communities to survive climate hazards is not to be overlooked.

Samuel Awuah-Nyamekye supports Chanza's claims that, instead of what can be generated from Western scientific laboratories or modes of observation, IK is a non-Western epistemology (Awuah-Nyamekye 2015, p. 225). The fact that it is not necessarily scientifically proven does not mean it is less true. We can use IK to enhance a more sustainable "Life on Land". For this, we need to consider Land productivity, its socio-cultural, religious, and even mystical dimensions. For Dennis Michael Warren,[17] IK is simply the "wisdom of people for survival in their own environment" (Warren 1991).

The range of views above shows that IK offers valuable resources for preserving natural resource bases and land. I build on all of the above understanding but rely on IK as turning toward the "sacramental universe" perspective, that is, embracing "the universe as a whole, in all its manifold relationships, which shows forth the inexhaustible richness of God".[18] It is the belief that "the natural universe is both the origin of life and the source

that sustains it" (Orobator 2018, p. 112). The "sacramental universe" vision invites us to think of the universe as "shaped by open and inter-communicating systems" [in which] "we can discern countless forms of relationship and participation. . .[and be] open to God's transcendence, within which it develops" requires faith to penetrate the meaning of the beauty that its mystery enfolds.[19]

The African indigenous cosmology of safeguarding the earth turns to this transcendence as a "spiritual rationale" and reality that always has the potential to emerge, constantly unfolding and revealing new aspects in peoples' lives. Though, subject to growth and renewal, African indigenous values are not a panacea as they, too, have their limitations, such as a good number of African leaders, despite being brought up in this indigenous worldview, do not seem affected by its immaterial values. The African indigenous cosmology suggests something affirming the whole of creation, in its material, ecological, and spiritual harmony, that constitutes a valuable resource for sustainable "Life on Land".

The indigenous Yaka people (in the Kwango Province of the Democratic Republic of Congo (DR Congo) help us grasp better the place of the creator in the sacramental universe view as they believe "*Ndzambyaphuungu* (the creator who inhabits the sky) is responsible for life, death, and all unanswerable questions" (Patgiri et al. 2024). Those familiars with Thomistic language can find similiarity between this vision of the Yaka *Ndzambyaphuungu* and Thomas Aquinas' treatise on Creation, particularly his affirmation of "[t]he very order of things created by God shows the unity of the world" and this world exists in the divine "ordaining wisdom" by which God governs it all.[20] *Ndzambyaphuungu* for the Yaka governs it all, and this belief has ethical implications on how they relate to land, farming, and hunting.

Wangari Matthai's "The Green Belt Movement (GBM)", founded in Kenya in 1977, is resourceful in grasping the above indigenous sacramentality of the universe. The Green Belt Movement (GBM) has been a source of inspiration, including women who believe in the sacramentality dimension of their forests, and this conviction grounds their resilience. The GBM embraces several dimensions: physical and environmental, economic, sociocultural, religious, and even mystical. Wangari responded when asked whether planting trees is a spiritual practice for her. She responded, "I'm sure it's a combination of both ecological and spiritual because I'm sometimes doing it out of a conviction that I'm trying to conserve [what] was created and has been destroyed. But it is also true that you're doing something very physical. As you do that, you're almost participating in the act of the creation" (Parabola Editors 2017). Wangari made clear that she embraced the vision of the Kikuyu people of Kenya whose traditional religion called to be "very spiritual in the way they related to what they would have called their creator" (Parabola Editors 2017). She adds that she could not stand seeing a tree being cut; hurting a tree was like hurting herself. In the spirituality of the Kikuyu, her indigenous people, the living and the dead are all together. The dead do not go to a place called "heaven". They are "in the forest or on the mountain. That made them feel as though they were part of the past and the future. You couldn't destroy the land because you were destroying your ancestors, and if you did you'd have nowhere to go when you died or no place to be born into. Your whole being revolved around the land" (Parabola Editors 2017). About the meaning of trees she argues that,

> I see trees as human beings upside down: because we humans have legs and we feed ourselves through our mouths, and the trees feed them themselves through the roots. So it's as if they have dug themselves upside down and their legs and hands are dangling out. When I look at the trees I see living things, and every tree seems to have its own personality, its own identity. Some are tall, some are

> short, some are literally small on the ground. But they are all alive. They die when we cut them, and they disintegrate just like us (Parabola Editors 2017).

By destroying the trees, one hears them say, ""Let me live, because when I live, you live". We are so dependent on them" (Parabola Editors 2017). There can be no more powerful way to express the vision of the "sacramental universe" than Wangari Mattahi does through the GBM. Catholic teaching would agree with me on this latter claim as its teaching on environment sustainability has shifted from a traditional utilitarian approach to nonhuman goods, which are to promote the well-being of humans, to a more holistic approach. This is well summarized in *Laudato Si's* two central themes: the Gospel of creation and integral ecology, with a pressing call on ecological conversion and ecological gratitude. Pope Francis emphasizes the concept of "integral ecology" that promotes a harmonious relationship with nature to restore a peaceful coexistence with the environment, rejecting the ethos of violence, exploitation, and selfishness.[21] No wonder, he has deeply embraced the sacramental universe vision of the indigenous peoples, valuable not only to sustainable "Life on Land" but also to the UN SDGs; they strengthen their "autonomy, competence, and relatedness" (Annett 2022).

6. African Indigenous Cosmology, Epistemology and Sustainable Development

African cosmological views are deeply rooted in African religion—"a way of life [ ] originated and unfolded in a spiritual *ethnosphere* [ ] sustained by an unwritten code and practice that had been handed down by another generation, embodied in mystery and spirituality, rooted in transcendence and immanence, and expressed through ritual and worship, myths and narratives, ethics and norms" (Orobator 2018, p. 13). I maintain that understanding the meaning of African religion is crucial to grasping the relevance of African indigenous peoples' practices I will present below.

Several cosmological African indigenous views and "cultural capital" constitute the wells, spiritual and cultural forces, that keep the earth's fresh water flowing out of the mountains. For Orobator, African cosmology "comprises a phalanx spiritual entities of forces, attempting to tame or neutralize malevolent ones and harness the positive energy in the benevolent ones" (Orobator 2018, p. 80). Its belief system, which I argue is a means for sustainability, continues to guide people in daily life today and shapes their behavior, whether they are Christians or observers of ATR.

"Globally, there are an estimated 370 million indigenous people" (Leal Filho et al. 2021, p. 1), among these over 1000 are located path throughout Africa (Patgiri et al. 2024). Among the world indigenous peoples, several large groups identify as African indigenous communities, including the "Berbers [who] inhabit countries in the North and Twa [also named Batwa like those of Uganda and DR Congo] (also known as Pygmies) and Maasai, among many others, [who] live in Central and East Africa" (Buchholz 2022). Other groups are the Afar (1.4 million), Borana (2 million), Endorois (20,000), Fulani (100,000), Hadza (700–800,000) (Leal Filho et al. 2021, p. 3), San and Himba peoples of Namibia (United Nations 2013a), Yaka, and the Shona who are counted around 9 million (Patgiri et al. 2024). To narrow the scope of this article, I limit my use of the concept "African indigenous peoples" to these communities as they have used various adaptation mechanisms (Leal Filho et al. 2021, p. 3) and will engage African epistemological knowledge and conservation practices, focusing only on a few of the above groups.

It is urgent to embrace African indigenous theological epistemologies as a to a sustainable "Life on Land". Orobator explains that the point is not about distinguishing the local versus the universal theologizing or the African versus the Western. Still, it is about new theological thinking that affirms the relevance of context analysis, starting from

cultural—experience that provides knowledge (Orobator 2018). It is a knowledge African women theologians would say is driven by a religious and cultural hermeneutic, not only from a hermeneutic of suspicion, in harmony with what Moleki Asante has called Afrocentricity, the necessity to examine "all data from the standpoint of Africans as subjects and human agents rather than as objects in a European frame of reference. . . The Afrocentric method suggests cultural and social immersion [instead of the] scientific distance as the best approach to understanding African phenomena" (Amenyedzi 2024). Likewise, in addressing development issues, Paul VI's claim that "The present situation of the world demands concerted actions based on a clear vision of all economic, social, cultural, and spiritual aspects".[22]

Mawere and Awuah-Nyamekye refer to the Indigenous Akan of Ghana's view on sustainable development "as any human activity that (a) aims at affirming life in a holistic way, (b) enables every generation to ensure its survival; and (c) enables generations to hand over the survival potential to the future generation as directed by culture (which is hugely influenced by religion)" (Mawere and Awuah-Nyamekye 2015, p. xvi). So, beyond empirical data, observations, and scientific laboratory tests, "in Africa, cultural capital together with environmental conservation knowledge and other such skills are profoundly interwoven in the mantra of sustainable development" (Mawere and Awuah-Nyamekye 2015, p. xvi). These views should not be dissociated from religious views, as they helpfully and wholly grasp nature's intrinsic values.

Scholars across various disciplines agree that "sustainable development has to be understood as a notion which focuses more on the sustainable livelihood and well-being, rather than well-having, which is an attitude created and encouraged by the capitalist world view" (Traoré 2015). The examples of the epistemological and cosmological dimensions of the African indigenous system discussed below align well with Bernard Lonergan when he argues that both experiential or empirical and explanatory or speculative conceptions of space and time possess genuine merit, provided they can be verified (Lonergan et al. 1997, pp. 108–9). This follows his argument that experiential and scientific knowledge conceptions are both supportable and reliable. Where needed, these experiential dimensions of IK shall correct and complement the modern UN Conservation neoliberal framework.

Indigenous epistemological knowledge and practices of conservation and famine mitigation, in general, and forest restoration, in particular, are to be integrated into the development and their environmental policies if we are to ensure sustainable development. Mawere and Awuah-Nyamekye have already suggested that finding "a way to dovetail the African Indigenous Knowledge Systems (AIKs) into the Western scientific knowledge to holistically tackle the challenges that confront and threaten sustainable development in Africa" (Mawere and Awuah-Nyamekye 2015, p. xxvi) is imperative. They argue that post-colonial governments have relied excessively on "Western theories, developmental frameworks, conceptualizations" (Mawere and Awuah-Nyamekye 2015, p. xiv). Therefore, their development goals of "Life on Land" and forestry conservation depend on these frameworks. This dependence alone is dangerous and threatens sustainable development. For, "sustainable development is not realized on a silver platter, but through hard work and determination" (Mawere and Awuah-Nyamekye 2015, p. xx) and "self-determination".

This self-determination is part of the AIKs "cultural capital" and encompasses Orobator's claim that "'Life on land' is not construed only as a reality constituted by the living; it also includes the ancestors and the yet-unborn—in other words, all the constituents of nature" (Orobator 2018, p. 111). It comprises several ecological siblings, "self, others, the spirit world, and nature" (Orobator 2018, p. 111). It is about identifying and communing with the land and its surroundings as kin. "'Life' [on land] encompasses the universe of plants, animals, and nature. Life [on land] guarantees wholeness and universal harmony

within and between the material and the spiritual reals" (Orobator 2018, p. 116). We are in trouble if we keep ignoring this rationale and spiritual truth.

As the Kikuyu illustrates through Wangari Matthai's claims above, the African indigenous peoples believe the divine is embedded in every single plant and tree; it dwells in the forests. Viewing the divine in nature impels them to protect and venerate nature. This motivation should not be dismissed as an animist—Animism was once regarded negatively in anthropology, but it is now gaining respect when viewed from a Native perspective as relational epistemology rather than just a scientific label (Bird-David 1999). Indigenous motivations have worked for thousands of indigenous communities worldwide. It has been a source of autonomy and skills-building. It has also grounded their moral life, especially around the awareness of interrelatedness and connectedness with all created beings; It has shaped their "sacramental universe" vision. These are immense resources for any ethic that aims to uphold sustainability or any development that aims to be sustainable.

Many anthropologists have shown that, though there have been various strands of ATR, they have been featured by myths, folktales, proverbs, symbols, rituals, images, the idea of ancestorhood, sacred sites and spaces, ecological taboos, and so on, as constitutive of the African cultural heritage, which dive deep into the past (Lusala Lu ne Nkuka 2023, p. 25), and convey different messages about life and death. The imagination of this heritage is not something static, and of the past; it has proven dynamic and generative of "Life on Land" and can be sustainable for today's challenges facing Development in Africa. Still, it needs to adapt to the post-modern challenges creatively. This imagination shapes what some anthropologists consider cosmological principles and moral activities in African indigenous Religion. Cosmology is "structured upon a hierarchy of spiritual forces" (Ioannis Kyriakakis 2012) that are objects of the above cultural heritage, shaping practices and skills that help protect the land. Thus, African "indigenous methodology recognizes the rich diversity of cultures and contexts and should not be perceived as a fragmentation of knowledge" (Shomanah and Matholeni 2024). This methodology doesn't overlook any indigenous structure that denies what postmodern societies consider choking or obstructing the fundamental dignity of the human person.

To illustrate the above, the Borana people are known to have "regionally developed social stratification consisting of four hierarchical strata. The highest strata were the nobles called the Borana, below them were the Gabbaro (some 17th to 19th century Ethiopian texts refer them as the dhalatta). Below these two upper castes were the despised castes of artisans, and at the lowest level were the slaves" (Patgiri et al. 2024). This structure is similar to the caste system of India. It is hardly a moral teacher. It doesn't ignore some indigenous practices of sacrificing animals to ancestors that do not make sense to our ecological understanding (Inman 2024, p. 18). Nonetheless, there is more we can learn from indigenous "cultural capital" that is relevant to foster a sustainable "Life on land" in our postmodern communities. As pope Francis suggests, "take charge of your roots, because from the roots comes the strength that will make you grow, flourish and bear fruit".[23] For pope Francis, "interest and concern for the cultural values of the indigenous groups should be shared by everyone, for their richness is also our own".[24] Although these values may be embedded with imperfections from a Christian standpoint, the efficiency of their claims shall be understood through what Christina Astorga refers to as the "pragmatic consequences on personal and communities" (Astorga 2014, p. 54).

I consider only a few of these values: Ancestorhood, Practices of Customary Land, Systems of sacred spaces, and ecological taboos and how they sustain a self-determined "Life on Land". These values are worth considering to the extent that they can reconstruct and strengthen "neighbor-love life as they aim to prioritize "meeting human needs and Earth's needs over maximizing profit and accumulating wealth". (Moe-Lobeda 2013,

p. 231) They mean to show the indigenous embracing "a spiritual approach to ecological commitment" to preserve land that can benefit the whole planet (Johnson 2024, p. xii).

7. Ancestorhood

"Ancestorhood" (ancestor veneration) is significant since so much of cultural heritage comes from the ancestors. Ancestry is essential for uniting people, land, and the environment, fostering a strong and meaningful connection. To illustrate, the Shona believe in *Mwari*, the creator god, which drives the importance of honoring ancestral spirits. This reverence aims to secure good health, abundant rain, land flourishing, and success in their undertakings, essential for a thriving community and its future. This is especially the case among many Native African peoples. In this way, ancestry is a tool for a sustainable preservation of land and the environment as it helps foster the conviction of "integration, interdependence and interconnectedness of all creaturely and heavenly realms" (Musili 2024, p. 7). Interdependence and Interconnection allow a vision of "continuity of life and connections (in its great diversities) to the extent that even death does not break the circle of life" (Owusu-Ansah 2024). It allows consideration of the continued life of the soul, as those ancestors usually referred to in African indigenous religion are physically dead but still alive by their living soul and legacy. Thus, Ancestorhood cannot be detached from the "sacramental universe" perspective, land protection, and preservation as it affirms interrelatedness. This interrelatedness brings healing and dictates conduct to maintain a healthy land. For the Himba, for example, ancestors mediate the entrance to sacred spaces; these are relied upon to heal the sick (Inman 2024, p. 13).

In the African worldview, the "connection between land, rainfall, good harvest, and ancestors [is emphasized. For example], The shortage of rainfall is perceived in Setswana culture as a failure to adhere to the environmental ethics that guide interpersonal relations as well as the relationship with the environment" (Madigele 2024, p. 28). Where there isn't healthy land, there is no life. But the vision of healthy land was all part of the indigenous "sacramental universe" view as Emilia N. Inman conveys in the story of a Himba who converted to Christianity:

> "Our faith was merely in our ancestors. We believe they protect us; they bring rain, heal us, feed us, multiply our livestock, bless us, and everything. As long as we had our livestock, life was sorted. We also used traditional remedies to heal the sick, using spells and plant-based materials from spiritual trees such as Mopane, Grewia species, and Terminalia to call on the spirits for healing. We have been hearing the name of God for a long time. We knew there was 'Mukuru' controlling the universe [...]".

As Orobator suggests, this conversation is often termed as "animist" culture, which "covers a broad spectrum of religious beliefs, attitudes, and practices whose common denominator is the investment of natural objects with power, energy, or vitality. [ ] it is "belief in spirits" embodied in nature" (Orobator 2018, pp. 13–14). Ancestors are "animistic" for any group that overlooks their role in helping maintain sustainable "Life on Land" even though they have been part of its ontological, epistemological, and cosmological worldview. Still, ancestors are "spirits" of some sort. Christian belief in angels is also animistic since, by definition, angels are pure "spirits". Ancestors veneration is significant since so much of cultural heritage comes from them. This is especially the case among many Native African peoples. Like Orobator, I claim that this belief impulses the ecological sensitivity of many indigenous groups, and it is still inspiring to restore our relationship with the physical world, which we tend to strip from its spiritual embodiment.

The Twa people of Uganda resisted the government's unlawful evictions since 2013 out of the conviction that there is no "Life on land' without ancestral land. Ownership

of land property, a basis of most world capitalism, was not the way of life of indigenous peoples. Ownership of property serves more intergenerational wealth excludes and even extinguishes indigenous peoples who only relied on their ancestral lands. As Pope Francis puts it, indigenous are treated as "intruders or usurpers",[25] "expelled from their cultural context", and subject to a new form of slavery or "a new version of colonialism".[26] Based on this same logic of handing the land to the new owner, whether for reservation or personal use, the Ugandan government evicted the Twa people from their ancestral lands to enhance the carbon-pricing model of reservation and protection of forests (The International Work Group for Indigenous Affairs (IWGIA) Mamo 2022, p. 630). The Twa pygmies of the Kahuzi Biega Park in DR Congo also suffer evictions from their ancestral lands, though they rely on them for "medicine, food, and shelter and have their own sophisticated codes of conservation" (Pezzi 2022). I am not advocating we should learn from any indigenous mythical teachings because they convey their own ethical warrants that require assessment from our postmodern contexts. I claim that learning from indigenous "cultural capital" can help postmodern African ecological crises and food and medicine dependency. Africa cannot ensure a sustainable "Life on Land" just by imposing Western imperial models of land conservation. There is much to learn from African indigenous epistemologies in making a sustainable "Life on land". For,

> "[L]ike a mother, the land produces food and provides medicine and refuge or shelter. The land also provides comfort through cool shades, birds singing, beautiful blooming flowers, and scents. It provides survival and coping mechanisms, especially when the season and environment change, to teach that nothing is permanent and eternal. When flowers bloom and dry up, it is a lesson to help people to cope with loss" (Madigele 2024, p. 28).

Land in African religious cosmology is a moral teacher of life. Land teaches that we are related and dependent on the goodness of creation, and we come from those whose survival depended on land—the ancestors. We also benefit from their virtuous ecological gratitude that we strive to embody. These dimensions of land corroborate "[t]he practice of thanksgiving [which] teaches that land, ancestors, rainfall, and good harvest are connected" (Madigele 2024, p. 29). This connection is a spiritual rationale for indigenous peoples and should be for all peoples, no matter how this rationale is known. Thus, pope Francis is very correct in saying, "To protect the Amazon region, it is good to combine ancestral wisdom with contemporary technical knowledge, always working for a sustainable management of the land".[27] This claim is also relevant to the African Congo Basin. African indigenous peoples have developed skills to keep the land safe and allow future generations to survive. Their paradigms go beyond the conventional economic ones. The customary arrangements to use land are among these paradigms.

8. Practices of Customary Land

African indigenous customary land practices and restrictions are rock-solid grounds for sustainable forest conservation. According to Chanza, customary land practices enhance carbon sequestration, combat greenhouse gas emissions, and enable ecosystems to provide essential community adaptation and resilience services (Chanza 2015). Chanza's latter conviction supports the Catholic Church's vision of sustainability that,

> "rejects nothing that is true and holy in [other] religions. [The Catholic religion] regards with sincere reverence those ways of conduct and of life, those precepts and teachings which, though differing in many aspects from the ones she holds and sets forth, nonetheless often reflect a ray of that Truth which enlightens all men". [28]

What kind of truth enlightens all people about a sustainable "Life on Land"? To answer this question, I rely on Katongole's point that "the truth of a story is judged by the reality it creates and the lives it shapes" (Katongole 2022, p. 173). We can know this truth through stories and the integrity rationale that can be found in these stories about the land when we look at the fruits they bear, as the Gospel of Matthew suggests, "By their fruits, you will know them" (See Matthew 7:16).

The truthfulness in AIKs can also be seen in the sustainability dimensions of their stories as they are seen in indigenous alternatives, strategies, and mechanisms that can feed, "heal, and save" (Katongole 2022, p. 34). The first one is the communal ownership in their use of land. Communal lands were fields where people came together and worked together, planting crops and hoeing weeds. These spaces were not only for agricultural purposes to feed the communities, they were healing spaces. There, people shared their joys and hardships through songs and other spiritual practices. Thus, the relevance of Madigele's claim that,

> "Traditionally, land does not belong to a single person but to a group of people. This means that those occupying it are not necessarily owners but have been entrusted with the responsibility to use it to improve their well-being and the well-being of other family members. This land has a wider intergenerational connection and has a sacred meaning" (Madigele 2024, p. 29).

The latter connection and meaning lead many Indigenous communities to fight against government postmodern laws that leave them "landless, destitute people. . . and left them a disadvantaged and marginalized people" (The International Work Group for Indigenous Affairs (IWGIA) Mamo 2022, p. 154). This is the case of the Twa people of Uganda cited above and the Massai of Kenya.

Many of the Massai have been struggling to recover the customary land practices not without conflicts. Conflicts over lands are not only postmodern land reform issues; they have existed in traditional Indigenous communities. However, today, customary lands are vetted with many conflicts related to new laws that allow the dispossession of lands from the indigenous peoples who often occupy lands not by law but by ancestral rights. Though, "in Kenya, even the pursuit of individual land is seen locally as having collective significance" (Munei Kimoei Ole 2010) making the vision of customary lands not totally obsolete in postmodern Africa. Thus, even when there are conflicts over land where communities are drawn to communal lands, indigenous customs still suggest that there is more to land than individualistic ownership of land and property rights.

The valuable traditional practices and strategies used by the Shona indigenous communities in the past are still highly relevant in addressing challenges such as drought and famine and enhancing food security in post-colonial Africa in the face of climate change. For instance, the Shona community's cultural heritage includes the practice of *Zunde ra-Mambo*, a "chief's common granary", which involves communal fields designated by a chief for cultivating food crops, promoting a sense of social welfare, and enhancing the community's adaptive capacity. Besides, the *Afar,* located in Ethiopia, southern Eritrea, and Djibouti, were known for making "their living as fishermen, but most are pastoral nomads who work herds of sheep, cattle, goats, and camels. . .. At the turn of the twentieth century, when a railroad between Addis Ababa and Djibouti City was completed, the Afar were introduced to a commercial economy and valuable trade goods; over the course of the century, they began to supply more and more meat, butter, milk, and hides to buyers in the cities" (Patgiri et al. 2024). How much the post-modern poor rural and urban communities would benefit from the *Zunde RaMambo* and *Afar*?

Jean Marl Ela, referring to this indigenous granary practice, suggested a "Ministry of the Granary", meaning food sovereignty, which the local communities can ensure for their

children's survival. He called on stopping the mechanisms that "hijack" food production and distribution, "stealing the harvest", and literally emptying the granaries (Ela 1986). In this sense, one can easily ask whether carbon markets can be sustainable where food security is not met. Today, most indigenous communities in postcolonial African states barely have access to lands as these are now monetary-driven (Mawere and Mubaya 2015, pp. 8–11) and urban cities like those of DR Congo import most of the dairy products and meat. Those with small amounts of land in urban areas have inherited the postmodern colonizing mentality that money buys everything, including some vegetables that one could harvest in one's backyard. An individualistic monetary-driven approach to land perpetuates hunger on the land and is a serious challenge to food sovereignty.

Teresia Hinga's vision on food *sovereignty*—"the right of peoples' communities, and countries to define their own agricultural, pastoral, fishing, food and land policies which are ecologically, socially, economically and culturally appropriate to their unique circumstances" (Hinga 2015) corroborates the "self-determination" vision that is desperately needed to ensure sustainable "Life on Land". The latter shall strive to fill the granaries to be sustainable.

Another alternative practice of the Shona people worth noting is known as *nhimbe*—"People coming together and working to achieve a common goal" (Mawere and Mubaya 2015, p. 12) through crop practices and social events where the community learns to work together. I agree with Mawere and Mubaya that these are "ideals of socially-centered human development" (Mawere and Mubaya 2015, p. 12) that could be termed as Marxist. Still, modern impoverished countries desperately need to achieve a sustainable "Life on Land". These practices helped the Shona achieve "[d]rought-resistant crops" (Mawere and Mubaya 2015, p. 13), which allowed them to minimize the impact of drought and reduce hunger on their lands. They grew "drought-tolerant cereal grain crops" like sorghum and millet, adaptable to climate change and poor soils (Mawere and Mubaya 2015, p. 13), without requiring too many ingredients that would need money. These practices helped improve households' food security, as they could "be stored over a long period" of two to three years, are affordable for the vulnerable, and their seeds can be easily shared than the maize's. (Mawere and Mubaya 2015, p. 14).

Another strategy is polyculture, or mixed cropping, which allows for efficient use of nutrients and water from different soil layers and more effective light interception. It also aims "to improve soil conservation" (Mawere and Mubaya 2015, pp. 14–15). Many other sustainable practices rely on their African IK of wild vegetation to preserve fruits, berries, and vegetables, which provide important minerals and vitamins, especially during the dry season. Dependence on modern pesticides that need to be lent by Western countries to developing countries kills "Life on Land". The Shona people also processed and preserved their food by drying vegetables, fruits, and meats and using certain plants as salt substitutes. Today, impoverished people in urban and rural African areas depend on imported salt from overseas, such as in China and Brazil (Mawere and Mubaya 2015, pp. 16–17). There is no way a sustainable "Life on Land" can be achieved out of primary crop dependency.

How would post-colonial, Sub-Saharan countries look if their post-colonial governments could foster these African indigenous alternatives, strategies, and mechanisms allowing people to work on communal lands? How would they look if they were to build roads for the crops to reach distant urban areas rather than depending on food importation from developed countries? How would they look if they appropriate reforestation without depending on carbon markets whose revenues get lost in governmental corruption and heavy bureaucracy? The indigenous peoples who have not been dispossessed from their communal lands still have much to offer to postmodern societies. A sustainable "Life on Land" cannot succeed without this vision of appropriation of healthy mechanisms of land

protection that communal use of land crops can provide. The individualistic approach developed in modern societies where everyone strives to buy a small amount of land in a polluted atmosphere has proven unsustainable. Yes, "the pursuit of sustainability requires major changes in international economic relations" (Brundtland Commission 1987c, para. 1) (See M15). But, first of all, significant changes in internal economic policies are required to reduce economic dependency and protect the land's sacred sites.

9. African Indigenous Systems of Sacred Spaces

Sacred sites have a long history in the phenomenology of religions and are central to all religions. In African indigenous religions, sacred places like "mountains, hills, forests, groves, caves, trees, rivers, pools, huts, graves", are considered manifestations of the divine. As Magesa puts, "the big rock where people go to sacrifice is not just a big rock, but it incorporates, shows and for that reason, some supernatural quality of the divine" (Magesa 1997, p. 61). These places make the surrounding cosmic milieu qualitatively meaningful. This insight provides a fascinating perspective on the spiritual significance of these locations (Shomanah and Zvingowanisei 2024). Sacred sites have played tremendous roles in environmental sustainability in African indigenous societies whose systems generate new sustainability knowledge, which is reflected in stories that have fostered "diversity of seeds, wellness of soils, cleanliness of the water, and thriving communities for generation after generation" (Takawira-Matwaya 2024, p. 51).

Akiti Glory Alamu, referring to the Shona stories, argues that "sacred spots are catalysts for sustainable environmental development. . . every tree, every spring, every stream, every hill had its own genius loci, its guardian spirit" (Alamu 2015). Sacred spaces remind the dependence of human beings on things that coexist with them and without which they cannot live (Takawira-Matwaya 2024, p. 59). Sacred spaces are visible symbols of the "sacramental universe" vision and aim to protect land in all its forms, visible and invisible. They justify the vision of ecological taboos in indigenous cosmology. Beyond the physical, "one can come across God in such places, sensing divine presence in the beauty." (Johnson 2024, p. 67).

10. Ecological Taboos

Taboos are prohibitions regarding particular objects perceived as embedding divine traits (Magesa 1997, p. 75). Ecological taboos are part of the African "eco-friendly attributes" (Okonkwo 2011), which include land designated for tree growth and totems safeguarding the land from harmful practices. Christian theology has long affirmed the view that the environment is graced by God, "having the spark of the divine", and intimately related to the triune God.[29] I have already shown how ATR upholds this view, affirming the sacredness of Mother Earth. John Mbiti upholds that the universe Africans live in is religious; all phenomena and objects are intimately related to God, so the African worldview doesn't conceive well-being apart from that of the total creation. As he states, "If man abuses nature or the environment, nature also will abuse man" (Mbiti 1977).

It is incredible how "sacramental" the ecological taboos seem to be for the forest communities of Mabaka where some of the Yaka people live. The Yaka are subsistence farmers primarily cultivating cassava and corn (maize) as their staple crops. Like the Shona, the Yaka force of their beliefs is powerful and worth considering for keeping the land unharmed. It is fostered to "reduce disasters such as drought and famine should, therefore, not be underestimated" (Mawere and Mubaya 2015, p. 3). Restricted access to sacred sites was one of the ways to conserve the environment and its overall spiritual meaning that might still be relevant for ecologically sustainable "Life on Land" today.

11. Conclusions

This paper has shown the weaknesses of the UN market-based approaches to sustainability and has embraced Pope Francis's call to move from weak international ecological political responses characterized by "new power structures based on the techno-economic paradigm"[30] that have kept growing to the spiritual "motivations born of faith" of different religions shedding "light on our relationship to others and with creation as a whole".[31] Pope Francis reminds us that we have not done enough. I have tried to do more, showing the gain in drawing on the religious motivations of indigenous peoples who strive to keep "Life on Land" safer and more sustainable and how the Iks can be resourceful for the challenges facing "Life on Land" in the post-modern era.

I have argued that sustainable development cannot be achieved without relying on local knowledge and resources, despite their supply scarcity. Indigenous systems of ecological adaptation should not be abandoned (especially in the face of capitalist exploitation of the environment). Anthropologists have demonstrated that indigenous peoples' agricultural and other resource-extraction techniques have come out of a heritage that has been tested for a very long time in that particular environmental setting. These techniques are not "primitive" in the sense of being "backward", but they have proven effective over very long periods (in most instances) given the social organization of labor among the Native people and their level of technological sophistication. This is not to say that the indigenous system provides a "perfect balance" in exploiting environmental resources, but it works (and has worked) for the people as a part of their cultural legacy.

Even though IK usually works at small scales and is not to be applied uncritically to any postmodern ecological crisis context, it delves into considerable historical depth beyond the confines of economic development strategies. It offers unique religious insights that can foster sustainability. I have argued that sustainable development shall drink from the wells of these practices and beliefs, learning from the experiential indigenous epistemologies, and have used some AIKs and practices for this purpose. The Brundtland Commission embraced this view by claiming, "No single blueprint of sustainability will be found, as economic and social systems and ecological conditions differ widely among countries. Each nation will have to work out its own concrete policy implications" (Brundtland Commission 1987a, para. 51) (See M16). It is unsustainable for communities to give up their local knowledge and depend on those imposed by governments through any carbon pricing contracts.

I have upheld the indigenous knowledge, whose intelligible component attunes us to the sacredness of creation. It invites us to listen to our sister, the land, that, as Pope Francis calls it, "now cries out to us because of the harm we have inflicted on her by our irresponsible use and abuse of the goods God endowed her with. We have come to see ourselves as her lords and masters, entitled to plunder her at will". (LS, 2) This paper has shown how we can learn to practice silence and wonder as paths to sustainable "Life on Land". Conservation policies disregarding these spiritual indigenous forces will undermine cohesion and economic power at the family and social levels and, therefore, cannot be sustainable. Sustainable Development Goals that aim at a sustainable "Life on Land" and climate restoration can do better in learning from the indigenous options and the experiential knowledge of the peoples that have protected their lands for centuries.

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Notes

1 LAUDATE DEUM, 67.
2 Mater et Magistra, # 169–172.
3 *Populorum Progressio*, # 14.
4 Sollicitudo rei socialis, # 28.
5 *Laudato si'*, 159.
6 *Laudato si'*, 193
7 Querida Amazonia, # 9.
8 "20,000 hectares and is bordered to the south by the National Road that links Kinshasa to Kikwit. The project consists of the reforestation of 8000 hectares using fast-growing species (eucalyptus, pines, acacias) and local species. This plantation is expected to produce local firewood charcoal to supply the city of Kinshasa with lumber, timber, and sequester carbon. It will foster regional development, which is currently very slow, by creating employment and improving the livelihood of the local population. The plantation will be sustainably managed and become part of the ecological and economic landscape. Moreover, ecological conditions in the project area are similar to those encountered in the Bateke plateau, which spreads from Angola to Gabon and across the two Congo nations. It will thus be possible to replicate the project and to adapt it to diverse socio-economic contexts" in (Mushiete and Malio 2009).
9 *Querida Amazonia*, # 14.
10 *Laudato Si'*, # 63.
11 Teresia Hinga argues that it "refers not only to quantitatively stocked up grain reserves but also to a social and economic situation that is characterized by the ready availability of adequate and safe foods, as well as the right to socially acceptable access by all people at all times to enough food for an active, healthy life". See (Hinga 2015).
12 *Summa Theologiae*, I, q. 47; art. 3. Resp.
13 Anthony M. Annett is A Climate Change and Sustainable Development Advisor at the Earth Institute, Columbia University.
14 Chanza, 90. Several authors are cited by Chanza, as they have done research on the "commonly deployed terms": indigenous knoweldge (Louise Grenier, 1998; World Bank, 2004; Nyong, A., Adesina, F. and Elasha, B.O., 2007; Sekine, H., Fukuhara, K., Uraguchi, A., Tan, C.K., Nagai, M. and Okada, Y., 2009; Green, D., Billy, J. and Tapim, A., 2010; Green & Raygorodetsky, 2010; Lwoga, E.T., Ngulube, P. and Stilwell, C., 2010; Roos et al., 2010); indigenous knoweldge systems (Du Toit, C.W., 2005; Le Grange, L.L.L., 2009; Mapara, J., 2009; Mawere, M. 2010); Local knowledge (Briggs, J., 2005; Peloquin, C. And Berkes, F., 2009); traditional ecological knowledge (Berkes, F., Colding, J. and Folke, C., 2000; Lefale, P.F., 2009); indigenous ways of knowing and climate change (Berkes, F., 2009; Nakashima, D.J., Galloway, M.K., Thulstrup, H.D., Ramos, C.A. and Rubis, J.T., 2012); traditional phonological knowledge (Turner, N.J. and Clifton, H., 2009); indigenous climate knowledge (Orlove, B., Roncoli, C., Kabugo, M. and Majugu, A., 2010); local ecological knowledge (Brook, R.K. and McLachlan, S.M., 2008); and endogenous knowledge (Hountondji, Paulin J, 1997)".
15 Chanza, 92.
16 Dennis Michael Warren is a former World Bank director of the Center for Indigenous Knowledge for Agriculture and Rural.
17 *Laudato Deum*, # 63.
18 *Laudato Si'*, 79.
19 *Summa Theologiae*, I, q. 47 art. 2, ad 1; art. 3.
20 *Laudato Si'*, 225–230.
21 *Populorum Progressio*, # 13.
22 Querida Amazonia, # 33.
23 Querida Amazonia, # 12.
24 see note 9 above.
25 Querida Amazonia, # 51.
26 see note 9 above.
27 Okonkwo, "Ecological Crises: From the Perspective of Christianity and African Traditional Religion". See also Francis of Assisi and Catholic social teaching, especially, *Laudato Si'*.
28 *Laudato Si'*, # 53–54
29 *Laudate Deum*, # 61.
30 see note 28 above.

[31] see note 29 above.

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