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Advancing Environmental Education for Sustainable Development in Higher Education in Nigeria: Current Challenges and Future Directions

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Abstract: The important roles of environmental education (EE) as a tool for advancing the United Nations Sustainable Development Goals (SDGs) have been clearly identified in national policy visions and guidelines in Nigeria. Despite this increasing recognition however, the implementation and delivery of EE programs remain adversely impacted by a wide range of practical implementation challenges. While a number of existing studies have compiled the importance of EE for advancing the SDGs, a detailed examination of the law and governance challenges that limit the implementation of EE programs in Nigeria has remained absent. This article fills a gap in this regard. Various legal and institutional challenges that arise with the design and implementation of EE programs in Nigeria are examined in order to identify the ways in which an integrative governance framework on EE can help close these gaps. The study suggests that an elaboration of coherent national strategy on EE; a dedicated budgetary allocation for EE programs; reform of the existing laws to ensure coherent implementation of EE programs; and the designation of focal EE units at higher education institution are significant steps towards improving the development and implementation of EE programs in Nigeria.

Keywords: environmental education; higher education and further education; access to education; social justice; education policies; right to education; SDG learning

1. Introduction

Goal 4 of the United Nations Sustainable Development Goals (SDGs) contains a commitment by all countries to “ensure inclusive and equitable quality education and promote lifelong learning opportunities for all” by the year 2030 [1]. Specifically, Target 4.7 of SDG4 aims to ensure that all learners “acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles” by the year 2030 [1]. Similarly, the UNESCO Education for Sustainable Development (ESD) 2030 Framework identifies education for sustainable development (ESD) as a key element of quality education and an essential enabler of all the 17 SDGs. The ESD 2030 Framework provides holistic guidance and tools for the implementation of these ambitious goal and commitments [2]. Several of these instruments recognize the importance of Environmental Education (EE) initiatives, i.e., courses, programs and activities that aim to promote holistic, lifelong and systematic understanding, knowledge and awareness of environmental issues amongst the local population [3]. EE programs include courses that provide knowledge and skill acquisition on environmental themes such as climate change; sustainability and responsible consumption; waste management, recycling and composting; water management; biodiversity, and ecology in marine and terrestrial ecosystems [4]. With a view to contributing to the attainment of all the 17 SDGs at the national and global levels, especially SDG 4 on education for all, environmental

educators worldwide are looking for new ways to advance excellence in EE initiatives and programs [5].

The importance of EE is also broadly reflected in a wide range of national strategies and policy instruments in Nigeria. Nigeria's National Report to the Rio +20 conference, as well as the 2020 Voluntary National Review, specifically identify the aim of the Nigerian Government to support a number of implementation imperatives and mechanisms to advance the attainment of all of the SDGs [6]. Similarly, the Universal Basic Education (UBE) Act, which is the main legal framework for primary education, clearly expresses its aim to promote "uniform and qualitative basic education throughout Nigeria" through the provision of free and compulsory basic education for all Nigerians [7]. The National Policy on Education of 2013 elaborates the policy guidelines, objectives, standards, structures, strategies and management techniques for advancing education as a tool for promoting social, economic and environmental development in Nigeria [8]. Furthermore, the Nigeria Economic Recovery and Growth Plan (ERGP), 2017–2020 aims to transform education in Nigeria into a tool for achieving economic growth and the SDGs [9].

Given these strong policy emphases on sustainable development, a wide range of EE programs and initiatives that aim to advance sustainable lifestyles and environmental awareness amongst the entire people of Nigeria are on the rise in the country. For example, virtually all higher education institutions in Nigeria have one or more forms of environmental education programs, ranging from core or elective courses that are part of degree programs to extra-curricular initiatives that aim to stimulate environmental awareness [10].

However, despite the increased awareness of EE as a tool for advancing the SDGs, a number of legal and institutional challenges continue to hinder the rapid development and implementation of EE programs and initiatives in formal education institutions in Nigeria. Furthermore, there remain challenges in access to quality, functional education in Nigeria, which in turn hinder the scope and reach of EE programs at all levels of formal education. For example, in 2017, the World Economic Forum ranked Nigeria 116th out of 137 countries in terms of the quality of higher education and training [11]. Similarly, more than 10 million Nigerian children still lack access to education, and were not enrolled in school as of 2019 [12]. Poor access to education in general has limited the scope and reach of EE programs as whole.

This article develops a profile of the existing gaps in the design and implementation of EE programs in Nigeria. A combination of gaps in the legal framework on education which limits the funding of EE programs, a poor curriculum that fails to emphasize EE, poor infrastructure investments, leadership challenges, and poor working conditions continue to hinder the development and implementation of EE programs and policies in Nigeria. Without addressing the legal and governance gaps to education access as a whole, the development and implementation of EE programs may continue to be stifled. This article provides recommendations on legal and institutional improvements that would increase the effective implementation of EE programs as tools for advancing sustainable development in Nigeria.

The article is divided into five sections. After this introduction, Section 2 examines the scope and status of EE initiatives being implemented at higher education levels in Nigeria. Section 3 highlights the key legal and challenges to the effective implementation of EE programs and initiatives in Nigeria. Section 4 proffers recommendations on how to address the salient gaps to EE implementation in Nigeria. Section 5 is the concluding section.

2. Environmental Education for Sustainable Development: A Survey of Current Implementation in Nigeria

As stated in the UNESCO-UNEP Belgrade Charter of 1976, the aim of environmental education is to develop a world population that is aware of, and concerned about, the total environment and its associated problems, and which has the knowledge, attitudes, skills, motivation, and commitment to work individually and collectively toward solutions of current problems and the prevention of new ones [13].

Furthermore, the Tbilisi Declaration, adopted at the world's first intergovernmental conference on environmental education organized by UNESCO, elaborated the objectives of EE to include awareness creation, knowledge dissemination, attitude and behavior change:

- Awareness: to help social groups and individuals acquire an awareness of and sensitivity to the total environment and its allied problems.
- Knowledge: to help social groups and individuals gain a variety of experience in, and acquire a basic understanding of, the environment and its associated problems.
- Attitudes: to help social groups and individuals acquire a set of values and feelings of concern for the environment, and the motivation for actively participating in environmental improvement and protection.
- Skills: to help social groups and individuals acquire the skills for identifying and solving environmental problems.
- Participation: to provide social groups and individuals with an opportunity to be actively involved at all levels in working toward resolution of environmental problems [14].

The ESD 2030 Framework builds on the foregoing by providing a global and holistic framework that can assist countries to scale up ESD action in all areas of education and learning [15]. The Framework identifies five priority action areas for promoting ESD, which includes transforming learning and training environments; developing capacities of educators and trainers; and accelerating sustainable solutions at local levels, amongst others. Evidently, to achieve excellence in EE initiatives and programs, comprehensive and holistic procedures and mechanisms must be put in place in the design, approval, implementation, and monitoring of EE programs, in order to achieve wide outreach and sustained long term impacts [16].

A holistic EE program will go beyond mere voluntary and stand-alone initiatives. Rather EE programs should fit within the core legal and policy framework on education in a country, in order to ensure proper and sustained allocation of resources that can enhance the long-term sustainability EE programs at all levels [17]. Furthermore, in order to promote wider societal objectives, EE programs should incorporate multiple perspectives and the collaboration of diverse stakeholders at all stages of the program from development to evaluation. Such stakeholders are those with shared interests, experiences and motivation for EE programs and include teachers, donors, policy makers, institutional leaders, parents, community groups, and curriculum developers [18].

Such wider participation “lends a variety of perspectives to the program, shaping the program focus and audience” [19]. A multi-stakeholder partnership (MSP) through the development of an integrated, coordinated, and cross-sectoral approach has been promoted globally as providing an efficient platform for different actors and stakeholders to come together to tackle a common issue that no stakeholder would have been able to tackle alone [20]. A multi-stakeholder approach to EE can achieve the dual purpose of increasing the coherence and effectiveness of EE programs while reducing the lack of knowledge and information sharing that has been noticed in current efforts. For example, a coordination mechanism will allow peer interactions and consolidation of efforts, which could significantly help learners to have shared access to high-quality learning materials, resources and EE-related activities. Similarly, during such country-wide collaborations, EE actors not only become more skilled at developing EE programs and initiatives, but they also gain more practical insights from working with other community stakeholders besides their students and colleagues.

In order to analyze how current EE initiatives in Nigeria measure up in terms of scope, relevance, societal impact in terms of advancing environmental awareness and protection in line with the 2030 Agenda, this study developed a profile of the scope and status of EE initiatives being implemented at the tertiary education levels in Nigeria.

Methodology

This study relies primarily on published government reports and data in Nigeria that document the current scope and status of EE initiatives being implemented in tertiary-level institutions. These include publicly accessible legislation, policy documents, and periodic reports collated and released by the Federal Government of Nigeria [7]. A qualitative analysis of these documents has allowed conclusions to be drawn on how current EE programs and initiatives are progressing in Nigeria, and the challenges to their implementation. Furthermore, an analytical review of published literature is adopted because existing research in the field has satisfactorily compiled the importance of EE for advancing the SDGs [21]. However, a detailed examination of practical challenges facing the development and implementation of EE programs in Nigeria has remained absent.

In order to review the nature and scope of EE programs, this study generated an analytical tool that could help the different stakeholders to conduct their own assessment of their EE programs following a common methodology. As presented in Table 1 below, the tool uses a set of criteria drawn from the extensive literature on EE to describe and assess the key attributes of effective EE programs and to determine whether those elements are integrated into the higher education landscape in Nigeria [22].

This article moves the discussion forward by examining the current challenges and future opportunities for mainstreaming EE programs and initiatives into higher education in Nigeria. Owing to the scope of the study and the nature of the methodological approach, the survey can by no means be regarded as representative. However, since this survey is combined with a review of the literature, this section provides an analytical profile of, and insights on, the key challenges facing the integration of EE programs into higher education in Nigeria and how those challenges can be addressed.

Table 1. Elements of a holistic environmental education program.

Relevance Effective environmental education programs are relevant to the mission of the institution, agency or organization; to the educational objectives of the audience; and to the everyday lives of the individual learners and the society at large.	Is there a clear and comprehensive linkage of EE program to the curriculum or core missions of the institution? Is the EE course or program required for completion of degree programs? What is the average time and cost to meet the requirements of the EE program? What is the procedure for approving, reviewing or accrediting the program? Are there practical components to the EE program? Are the content and methods concrete and relevant to key sectors and industries in the country? How are faculty members and trainers allocated and selected? Are there institutional programs in place for the professional development and training of educators in environmental education?
Societal impact and behavioural change Effective environmental education programs enable a diverse and wide audience to acquire a set of skills, values and feelings of concern for the environment. It inspires commitment and motivation for actively participating in environmental improvement and protection as part of personal and civic responsibility.	Is the program focused on environmental literacy as well as responsible environmental behaviour? What are the behavioural tools integrated to encourage responsible environmental choices by learners? What are the types of mechanisms put in place to help learners to behave in environmentally responsible ways? How many students and members of the immediate community are reached by the program? What are the mechanisms in place to adapt traditional teaching strategies to diverse communities and cultures?

Table 1. Cont.

Stakeholder engagement and partnerships	How easily can the public get information about the program?
Effective environmental education programs involve stakeholders in all stages of the program, from the development of the program to its evaluation.	Is there a requirement to consult other educators or stakeholders such as representatives of other schools, civil society, government and industry? Are educators able to share resources, training manuals and best practices with other actors? Are the educators funded and supported to participate in EE professional networks, conferences and workshops to exchange ideas and information on pedagogy?

Source: Authors.

3. Results

The importance of environmental education is broadly reflected in legislation, government policies and development plans in Nigeria. For example, the principal environmental legislation in Nigeria, the National Environmental Standards Regulatory and Enforcement Agency (Establishment) Act of 2007, expressly recognizes the importance of EE as a tool for sustainable development [23]. Article 7 (1) mandates NESREA to “create public awareness and provide environmental education on sustainable environmental management.” This provision authorizes NESREA to collaborate with education institutions in Nigeria to promote environmental education programs and initiatives. Furthermore, Nigeria’s National Report to the Rio +20 conference and the 2020 Voluntary National Review specifically identify the aim of the Nigerian Government to support a number of implementation imperatives and mechanisms to advance the attainment of all of the SDGs [7]. The National Universities Commission, which is the accrediting body for Nigerian Universities, has also elaborated clear guidelines for the development of environment related courses in Nigerian Universities. The Benchmark Minimum Academic Standards (BMAS) for Environmental Sciences shows the need to “produce competent graduates with sufficient contemporary theoretical knowledge and practical skills to deal with planning, design, construction, management and conservation of man-made and natural environment” [24]. Virtually all higher educational institutions in Nigeria have one or more forms of EE programs, ranging from core or elective courses that are part of degree programs, to extra-curricular initiatives that aim to stimulate environmental awareness.

However, while some progress has been recorded in promoting EE initiatives at tertiary educational levels, there has been a wide disparity in the relevance, societal impact, and thematic focus of EE activities. The scope, content, size, and outcomes of EE initiatives vary from one institutional actor to another, while information on the context for their implementation remain sparse. Practical challenges relating to inadequate funding, lack of capacity, lack of infrastructure, and low level of information on current and past initiatives, amongst others, continue to stifle to widespread and sustained implementation of EE programs in higher education institutions in Nigeria.

Key Impediments to the Implementation of EE Programs in Nigeria

A. Inadequate funding of education and EE programs:

The Nigerian 2020 Voluntary National Review documents insufficient funding for education as a key impediment to the attainment of the SDG on inclusive and quality education in Nigeria [7]. Over the years, the United Nations Educational, Scientific and Cultural Organization (UNESCO) has recommended that governments and donors should spend no less than 15–20 percent of yearly budgets on education [25]. In Nigeria, however, yearly budgetary allocations to education have been well below this recommended threshold. For example, in the 2017 budget, N448.01 billion was allocated to education, representing only about 6 percent of the N7.30 trillion budget [26]. The percentage of budgetary allocation to education was further reduced in the 2021 budget. In the 2021

budget, only 5.6 percent of the N13.08 trillion budget was allocated for education, which represents the lowest percentage allocation since 2011 [27].

The perennial failure to prioritize and devote significant resources to education has resulted in the underfunding of higher education institutions in Nigeria [28]. With many Nigerian Universities struggling to meet their overhead cost, resource allocation for EE and ESD programs have been significantly impacted [29]. Implementing quality and holistic EE courses and programs will require the commitment of budgetary resources for program development, staff recruitment, acquisition of teaching infrastructure, and books amongst others. Failure by successive governments in Nigeria to provide sustained funding to higher education institutions has stifled the development and implementation of EE courses and programs, and may continue to do so. Advancing EE in Nigeria will therefore require a commitment by the Nigerian Government to allocate more resources to the education sector. Furthermore, given the urgency of environmental challenges facing Nigeria, such as climate change, oil and gas pollution, and the extinction of rare plant and animal species, amongst others, there is a need for budgetary allocations directly targeted at promoting environmental awareness and EE at all levels of education in Nigeria.

B. Capacity gaps

The design and implementation of EE programs in higher education institutions in Nigeria is stifled by an insufficient number of skilled academics with expertise in environment-related disciplines [7]. For example, teaching environmental law courses would require expanding staff capacity or recruiting experts with research degrees in this area of law. Similarly, increasing the available number of courses and programs in science, technology, engineering, and mathematics (STEM) disciplines will require recruiting academics and researchers that can implement innovative pedagogical approaches. Furthermore, there will be a need to increase the number of scholarships and programs available for EE-related disciplines, as a way of encouraging students to enroll in doctoral programs in EE fields, which can help sustain a steady flow of highly skilled academics with expertise in EE fields.

Addressing capacity gaps is a cost-intensive commitment that requires dedicated and sustained funding for EE programs. However, over the years, the low level of funding to the education sector as a whole has adversely impacted the resources available to fund the required capacity development programs and initiatives that can boost the level of capacity available for EE.

In addition to the role of government in providing sustained and dedicated funding for EE programs, higher education institutions themselves will need to be innovative in leveraging available capacity and resources. There is a need for interdisciplinary approaches that foster the sharing of expertise and education resources across disciplines. A multi-stakeholder approach to EE can achieve the dual purpose of increasing the coherence and effectiveness of EE programs while reducing the lack of resource- and information sharing that has been noticed in current efforts. For example, one or more departments or colleges can come together to develop an environmental course or program that leverages the expertise of faculty members across disciplines. A necessary starting point will be to elaborate and develop a cross-sector analysis of key programs and courses that could be developed across the institution. It will also require sharing information and knowledge in open and linked systems. Such interdisciplinary linkages and partnerships, through joint initiatives and knowledge sharing, could increase trust and enhance synergic solutions that enhance the development and implementation of EE programs in a sustainable manner.

C. Poor infrastructure and Inadequate facilities for EE

Perennial failures by successive governments to prioritize investment in education has resulted in a situation whereby much of the infrastructure in place in higher education institutions in Nigeria were erected pre-independence. Lack of facilities, and deterioration of infrastructure as a result of age and rapid expansion have stifled innovation, research, and academic scholarship [29]. Aside from the dilapidated classroom and laboratory in-

frastructure in several higher education institutions in Nigeria due to age, many of the structures have been stretched beyond their original carrying capacity due to excessive demand traceable to overpopulation. Similarly, as the COVID-19 pandemic has demonstrated, the implementation of EE programs will require modern education technologies (Ed-Tech) to enhance the learning and teaching of environmental law [30]. EdTech, or disruptive education, requires the use of technology in both traditional face-to-face courses and online courses, to support learning outcomes. Through online discussion forums and technology-driven exercises, students can continue to learn key environmental law topics and exchange ideas even outside of the classroom. EdTech can also enable collaboration and scholarly exchange between students and faculty members in different parts of the world. This is particularly important for higher education institutions in Nigeria, as institutions with low capacity can benefit from guest lectures from practitioners, scholars, and educators in different parts of the world, who can present on specialist topics. [31]. Such wider participation “lends a variety of perspectives to the program, shaping the program focus and audience” [20]. For example, peer interactions and consolidation of EE efforts could significantly help learners to share access to high-quality learning materials, resources, and EE-related activities. Similarly, during such collaborations, students and ELE actors not only become more skilled at understanding the working of environmental law in other regions of the world, but also gain more practical insights from working with other stakeholders besides their own students and colleagues.

However, as the Nigerian 2020 Voluntary National Review indicates, due to funding deficits, ed-tech facilities are largely unavailable in virtually all higher education institutions in Nigeria, which limits the widespread implementation of EE programs. Advancing EE programs in Nigerian higher education institutions will therefore require significant technology renewal and upgrade in order to facilitate technology-driven and enquiry-based learning approaches.

D. Lack of clear recognition of EE in legal frameworks and national strategies on education

While EE is recognized in the NESREA Act, the key legislations on education do not expressly identify the importance of EE or ESD. One key reason why successive Nigerian governments have been able to get away with an uncommitted approach to university funding is the fact that the 1999 Constitution fails to provide a robust and enforceable recognition for the right to education in Nigeria. The Constitution places education under Chapter II, the Fundamental Objectives and Directive Principles of State Policy, which rightly provides that:

The Government shall strive to eradicate illiteracy; and to this end Government shall, as and when practicable, provide (a) free, compulsory and universal primary education; (b) free secondary education; (c) free university education; and (d) free adult literacy programme [32].

While the foregoing are robust provisions, Section 6, sub-section (6), paragraph (c) of the same Constitution, however, provides that the judiciary shall have no powers to decide on any issue or question as to whether any act of omission by any authority or person is in conformity with the Fundamental Objectives and Directive Principles of State Policy. This provision makes it difficult, if not impossible, for citizens to enforce their right to quality education in Nigeria. In essence, the Constitution in one breath contains aspirations about financing education, and in another breath, it makes it unenforceable. While recent case law and studies increasingly indicate that socio-economic rights are justiciable and enforceable in Nigerian courts, the lack of a clear and express recognition of a fundamental right to education in the Constitution, legislation, and education policies has not provided a coherent governance framework that prioritizes and accelerates the implementation of education programs in Nigeria [33]. There is an urgent need to address this gap and expressly recognize education as an important and enforceable fundamental human right. By so doing, students and stakeholders in education will have a robust legal basis to demand for the enforcement of their rights to education in all government programs, rather

than resorting to protracted litigation, strike actions, and protests. Without placing a strong constitutional obligation on the Nigerian government to finance education at all levels, the current situation in which higher education institutions are underfinanced, which limits the scope of possible EE interventions, may continue.

Furthermore, there is a need for a clear and express recognition of EE in key education legislation and policies in Nigeria in order to place EE squarely at the forefront of planning and decision making. For example, the National Universities Commission (NUC) Act, the main legal framework for tertiary education in Nigeria, does not contain any clear provision on the need for higher education institutions to promote environmental awareness [34]. Furthermore, the Tertiary Education Trust Fund (Establishment, Etc.) Act does not expressly recognize EE as a funding priority. As can be learned from countries that are making some progress in advancing EE programs, an effective starting point is to clearly recognize the obligation of education stakeholders to develop and implement EE programs. For example, Article 7 of Qatar's Environmental Protection Law expressly provides that "all authorities responsible of education shall include environmental awareness subjects in all the educational stages" [35]. Furthermore, the Qatar National Vision 2030 expresses a clear aim to foster the development of "[a]n environmentally aware population that values the preservation of the natural heritage of Qatar and its neighboring states" [36,37]. Similarly, the United Arab Emirates has launched its National Environmental Education and Awareness Strategy 2015–2021, which aims to integrate EE across all education levels [38]. The absence of clear national strategies, policies, or regulations that clearly accentuate the need for stakeholders in education sector in Nigeria to integrate EE in the design and implementation of education programs is a key oversight that continues to limit coherent implementation.

To advance the development and implementation of EE programs in higher education in Nigeria, it is important to clearly integrate EE into all education legislation and policies. This will not only place EE as a key objective of government, it could also go a long way in improving the level of financing and budgetary allocations for EE initiatives and programs across Nigeria. A clear and comprehensive National EE Strategy is essential to guide the domestic-level formulation, design, financing, and implementation of effective EE programs [39]. A national EE strategy or policy will clearly identify and outline the EE objectives, priority areas, and the opportunities and requirements for stakeholder participation in identified areas. Such a policy will identify opportunities for the multi-sectoral, multi-stakeholder, multi-level implementation of EE programs, as well as for the roles of different stakeholders in public and private spheres in financing such programs [19].

Mainstreaming EE into key education policies will also provide clear guidance and resources that can help higher education institutions develop tailored EE programs that can advance the sustainable development objectives and visions of the country in key priority areas. For example, higher education institutions could develop tailored courses and programs on oil pollution detection and management, which could help more citizens and residents to access employment and executive roles in the oil and gas industry thereby advancing national local content development objectives. Linking education policies to sustainable development through EE could also advance the development of the home-grown pollution control technologies needed to address a wide range of environmental challenges in key sectors [40]. Similarly, in the context of advancing SDG 7 on energy for all, important voluntary efforts that EE programs can promote include: reducing energy waste in their own homes, businesses and local communities; developing, supporting and financing small and medium scale ventures and projects that advance access to clean energy services; and integrating and increasing the share of renewable energy services and products into their energy demand mix [41]. By educating citizens to play active roles in promoting the SDGs in various spheres of activities and control, EE can provide essential tools for citizens to play active roles in advancing sustainable development.

4. Improving Legal and Governance Frameworks on EE in Nigeria

Setting national visions and targets on ESD and EE reflects political commitment towards expanding awareness on environmental protection as a tool for advancing the SDGs.

The next step, however, is for national authorities in Nigeria to develop a comprehensive and holistic legal framework to support the integration of EE into overall national planning on education, as well as into the framework for SDG implementation. This section proposes four key strategies needed to mainstream EE into national education policy and planning in Nigeria.

A. Develop national EE plans and strategies

To advance the comprehensive implementation of EE in higher education in Nigeria, a starting point is for national authorities to develop clear national EE strategies and guidelines that identify and outline EE objectives, priority areas, and the opportunities and requirements for private sector participation in identified areas. To develop comprehensive national strategies on EE, there is a need for transdisciplinary analysis and conceptual development of the various key EE stakeholders, disciplines and economic sectors to determine how EE programs can be implemented, monitored, and supervised across diverse domains to promote sustainable development outcomes. A national strategy on EE can also help detect and address conflicting or overlapping courses, program requirements, and accreditation policies across the different disciplines to identify opportunities for synergies. It can also allow for the development of consistent and coherent programs that eliminate overlap and inconsistencies. Such an operational framework will also make it possible for regulators such as the NUC and NESREA to evaluate the practical efficiency of EE programs and to measure/monitor progress based on predetermined timelines. A national EE strategy will also provide opportunities for greater cooperation and coordination between relevant stakeholders on education, environment and sustainable development, such as the NUC, NESREA, Ministry of Education, Ministry of Environment and the Office of the Senior Special Assistant to the President on SDGs OSSAP-SDGs, amongst others.

B. Establish comprehensive laws to support EE programs

In addition to developing clear national EE strategies, it is also pertinent to develop clear and comprehensive laws on that provide legal basis and obligation for educators to integrate EE courses and programs into all levels of education, including higher education.

A starting point will be to expressly recognize an enforceable constitutional right to education in the Nigerian Constitution. As noted above, while Nigerian courts have increasingly shown a willingness to recognize and enforce the right to education, citizens have had to resort to protracted litigation, protests, and strike actions to drive action in this regard [42]. Lack of an express constitutional right to education has resulted in the perennial underfunding of education programs generally, which has limited the required innovation and infrastructure needed to advance EE programs. [29]. Reforming the 1999 Constitution to include an enforceable right to education will place a strong constitutional obligation on the Nigerian government to finance education at all levels [28]. Furthermore, there is a need for the Constitution to place education within the exclusive oversight of state governments. Given the size and diversity of a heterogeneous nation like Nigeria, it is inconceivable to expect that the federal government will be able to effectively finance and oversee the education sector. Currently, not only does the federal government have strong control over the finances required to run the sector, paragraph 60 of the exclusive legislative list of the 1999 Constitution erroneously places the authority to regulate and “prescribe minimum standards for education at all levels” under the exclusive preserve of the federal government. In Canada for example, the Constitution categorizes education as one of the matters “of a local nature” and vests the absolute control of education under the exclusive powers of the Provinces, and not the Federal Government. The same goes for the United States and Australia, where each of the federating units have absolute autonomy and legislative responsibility to oversee their educational institutions [29]. Comprehensive

constitutional reform is required to address the structural gaps that stifle innovation in education and limit the implementation of EE programs in Nigeria.

In addition to constitutional reforms, there is a need for extant laws, such as the NUC Act and the TETFund Act, to clearly reference the responsibility of all authorities responsible of education to develop and finance environmental awareness subjects at all educational levels. Such clear legislative recognition will create a greater impetus for higher education institutions to accentuate the development and delivery of EE programs. A comprehensive policy and regulatory framework could also address questions relating to minimum course content, minimum percentage of annual budgets that higher education institutions must devote to for EE programs, scope of implementation, and requirements for cross-disciplinary partnerships, amongst others. It is also pertinent to establish comprehensive laws on public-private partnership investments so as to simplify and promote private investment and participation in public education technology and other infrastructure projects [43].

C. Need for Sustained Funding for Education and EE Programs

To accelerate the development of EE programs across higher education institutions, there is a need to establish a national emergency fund for the education sector and designate a significant portion of such funds for EE programs. For example, committing a minimum of 25% of the national budget, or 4% of the gross domestic product (GDP), each year to education could ensure that education infrastructure deficit is slowly reduced, while demands for new Ed-Tech and infrastructure are met. Given the importance of education to the 2030 Agenda, there is an urgent need for the Nigerian government to commit greater and sustained budgetary resources to education programs generally, and EE programs specifically [44]. For example, Nigeria has a Sovereign Wealth Fund currently worth about \$1.50 billion, being savings from excess crude oil sales [45]. The Nigerian Sovereign Investment Authority (NSIA) has identified four key priority sectors that will benefit from the 5-year priority Infrastructure Investment program of the fund to include agriculture, healthcare, real estate, power, and motorways [46]. However, the focus sectors identified by the NSIA do not include education. This oversight underscores the continued neglect for investment in education as a priority sector in Nigeria [27]. Without addressing the financing deficit in the education sector, the scope of implementation of EE programs in higher education institutions may remain stifled. Similarly, higher education institutions in Nigeria must engage with international development partners such as the World Bank, United Nations Environment Program, United Kingdom's Department for International Development (DFID), United States Agency for International Development (USAID), African Development Bank, Qatar Fund for Development, and the Bill and Melinda Gates Foundation, amongst others, to explore international funding opportunities for EE programs.

Furthermore, higher education institutions in Nigeria will need to develop their internal capacity to leverage EE programs as tools for boosting their internally generated revenue. The increasing demand for EE courses and programs in key sectors such as finance, management, engineering, petroleum, mining, and aviation, amongst others, mean that higher education institutions can explore innovative partnerships with industry organizations to understand and meet their EE training and certification needs. In so doing, higher education institutions can develop and market tailored courses that will promote sound environmental outcomes in key industries while also generating additional revenues for the implementing higher education institutions. By driving and financing EE programs through internally generated revenue and partnerships with key industries, the perennial dependence on government funding and budgetary allocation, which has not been sufficient for many years, will be progressively reduced and replaced with a more sustainable and efficient approach.

D. Establish focal institutions on EE programs

To promote the wide-scale development and implementation of transdisciplinary, multiscale, multisector, and integrated EE programs and projects across a higher education

institution, it is important to designate a focal EE committee or administrative unit that will coordinate the design, approval, and implementation of such projects across all units of the institution. For example, the mandates and functions of the Directorate of Academic Planning can be expanded and enhanced to integrate and monitor the implementation of EE courses and programs by all units of the institution.

Alternatively, a distinct Directorate on Sustainable Development can be established by universities and other higher education institutions to monitor the institution-wide integration of the SDG awareness programs and courses [47]. Apart from serving as a one-stop shop that will monitor and streamline the design and delivery of such courses to ensure interdisciplinarity, such a directorate or unit would also provide capacity development opportunities for administrators to acquire technical knowledge about the pedagogy, methodologies, requirements, and innovations necessary to enhance the quality and effectiveness of EE programs. By empowering and establishing a focal institution across multiple faculties, colleges and departments, such an entity can obtain relevant information and develop an institutional understanding about the process and methodology for sustaining EE programs. Furthermore, such a focal institution would need to spearhead active partnerships with relevant regulatory institutions such as the Office of the Special Adviser on SDGs to the Government of Nigeria, offices of the advisers on SDGs at the state level, and departments or units dedicated to SDGs. Partnering with these and other relevant regulatory bodies will widen access of higher education institutions to resources, both technical and financial, that may guide the design and implementation of EE programs.

5. Conclusions

The important role of EE as a tool for advancing the SDGs, especially those relating to water, energy, food, education, and climate change, has been clearly identified in national policy visions and guidelines in Nigeria. Higher education institutions have accordingly continued to develop new degree programs relating to environmental science, environmental law, and environment management. Despite this increasing recognition, however, the implementation and delivery of EE programs continues to be adversely impacted by lack of sustained funding for education programs. Furthermore, lack of a clear recognition of EE in the current legal and regulatory framework on education has not provided the required foundation for mandating action by key stakeholders in the education sector to design and implement EE programs. A coherent and coordinated framework on EE is therefore urgently required in Nigeria to accelerate the widescale incorporation of EE into education strategies at all levels.

There is also a clear need to scale up the design and implementation of EE programs in higher education institutions. First is the need for higher education institutions in Nigeria to clearly identify EE as one of their core strategic teaching and research missions, as a way of emphasizing its importance across the institution. When EE is highlighted and aligned with the core curriculum or missions of an institution, more institutional resources can be made available to drive EE programs. Given the importance of EE to sustainable development and the green economy transition in Nigeria, and the current dearth of available teaching capacity to drive implementation, there is a need for higher education institutions to prioritize the recruitment of environmental educators, scholars, researchers, and teaching assistants at colleges and faculties who can take the lead in designing and implementing EE courses. Higher education institutions can also accelerate capacity development for EE by ensuring that environment-related courses are offered as core courses, rather than as electives. This will enable the rapid development of a large pool of scholars, officers, and graduates trained and skilled in EE-related disciplines. Similarly, developing funded masters and doctoral programs on the environment can serve as an incentive for graduates to pursue specializations in such programs. Devoting financial resources to recruiting and retaining a wide pool of EE scholars and researchers can significantly increase the number of EE programs in Nigeria.

There is also a need for greater innovation and partnerships in order to support research and training activities for EE. Higher education institutions will need to leverage the support of actors such as development agencies, international organizations, financial institutions, technology companies, environmental foundations, and private donors who can assist in providing Ed-tech tools in addition to financial sponsorship for courses, workshops, conferences, and training programs that can advance the capacity for EE implementation. Further studies will also be required to better understand and address practical constraints to the accelerated deployment of such Ed-tech innovations and tools in higher education institutions in Nigeria.

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