World Journal of Advanced Research and Reviews

eISSN: 2581-9615 CODEN (USA): WJARAI

Cross Ref DOI: 10.30574/wjarr

Journal homepage: https://wjarr.com/

(Review Article)

Unlocking the potential: Sustainability finance as the catalyst for ESG innovations in Nigeria

Oritsemolebi Adebiyi [1, *], Simon Attah Lawrence [1], Mayowa Adeoti [2], Ada Onyinye Nwokedi [1] and Munashe Naphtali Mupa [3]

[1] *Johnson Graduate School of Management, Cornell, Ithaca, New York, United States.*

[2] *IESE Business School, Barcelona, Avenida Pearson, Spain*

[3] *Hult International Business School, Cambridge, Massachusetts, United States*

World Journal of Advanced Research and Reviews, 2025, 25(01), 1616-1628

Publication history: Received on 03 December 2024; revised on 08 January 2025; accepted on 10 January 2025

Article DOI: https://doi.org/10.30574/wjarr.2025.25.1.0108

Abstract

This article explores the critical role that sustainable finance has to play in furthering Environmental, Social, and Governance (ESG) innovations within Nigeria, a regional leader in sustainability across West Africa. Over the last decades, Nigeria has made reasonable strides in the development of renewable energy, waste management, sustainable agriculture, and eco-friendly infrastructure. However, significant financial barriers exist that make scaling such initiatives difficult: a general lack of access to green financing, high costs of borrowing, and weak institutional support. It also, through the use of both global and local data, discusses the interaction of financial mechanisms with ESG innovation in successful projects such as the Solar Power Naija initiative, the issuance of Nigeria's first green bond. The analysis also looks at systemic challenges and proposes some actionable solutions, including policy reforms, private sector interventions, and innovative financing models such as blended finance and digital platforms. With emphasis on the need for collaborative efforts among stakeholders, this article underlines the transformative potential of sustainability finance in driving Nigeria's ESG growth, fostering environmental resilience, and promoting social equity.

Keywords: Environmental; Finance; Governance; Innovations; Sustainability

1. Introduction

Sustainability finance is an emerging game-changer for the development of environmental, social, and governance innovations (ESG), especially in areas where the traditional paradigm of development fails. At the core of sustainable finance is the mobilization of financial resources toward projects, initiatives, and businesses that support sustainable development goals (SDGs). These include renewable energy, waste management, social equity programs, and governance frameworks that promote inclusivity and accountability. Sustainability finance represents a critical driver of innovations necessary to address some of the most pressing global challenges, such as climate change, resource depletion, and social inequality, by integrating financial systems with ESG objectives (Uwadoka, 2023). In fact, global green bond issuance surpassed $500 billion in 2021, a demonstration of growing momentum for sustainable initiative financing.

Sustainability finance is a catalyst and enabler in ESG innovation. It provides the much-needed funding required to research, develop, and implement solutions that balance economic growth with environmental stewardship and social welfare. The renewable energy sector, for example, has been one of the greatest beneficiaries, with investments in 2022 reaching approximately US$495 billion (Fernández, 2024). In many cases, ESG innovations demand heavy upfront investments that their long-term benefits cannot correlate with by way of traditional short-term financial returns. It is

* Corresponding author: Oritsemolebi Adebiyi

here that sustainable finance bridges the gap, offering bespoke financial instruments like green bonds, sustainability-linked loans, and impact investments, which encourage stakeholders toward ESG-aligned objectives. Sustainability finance also enhances accountability by necessitating quantifiable impacts connected with well-defined targets regarding ESG performance. In essence, it has instigated a culture of transparency and results-oriented investing.

The role of Nigeria remains critical for the sustainability story of the region since it is the largest single economy in West Africa. The country, therefore, retains a leadership position at a regional level, with more than 60% of GDP in ECOWAS (Adeoye, 2018). Rich in natural resources, a young population, and vibrant entrepreneurial drive, the country can lead from the front in ESG innovation. Within the last ten years or so, Nigeria has, in fact, given much cause to rejoice on various issues: renewable energy, sustainable agriculture, and eco-friendly infrastructure. For example, the off-grid solar market of Nigeria is one of the most rapidly growing off-grid solar markets in sub-Saharan Africa; firms such as Lumos and Green Village Electricity (GVE) Systems have been providing affordable solar solutions to off-grid communities. Besides this, the waste-to-energy sector has picked up, such that the Lagos State Government alone has engaged in turning over 2,250 tons of waste into electricity every day (Ogungbangbe, 2024). The commitment of Nigeria to international agreements, such as the Paris Climate Accord, also underlines its readiness to fall in line with global sustainability goals.

This notwithstanding, sustainability is a quite thorny path on which Nigeria treads, most especially in terms of finances. The financial ecosystem in Nigeria is underdeveloped; there is limited availability of affordable and long-term funding for ESG projects. High lending rates, the rates often exceeding 20% in the country, are deterring investment into capital-intensive ESG initiatives (OKEKE, 2024). For example, the IEA estimates that universal electricity access in Nigeria by 2030 would require an investment of $2 billion annually, compared with current funding levels (International Energy Agency, 2017). The scaling of ESG innovations is seriously hampered by high interest rates, perceived risks associated with sustainable ventures, and a lack of investor confidence. Besides, the insufficiency of appropriate policy frameworks and institutional support adds to these financial barriers, hence making it difficult for innovators to attract the capital investment required. The ultimate effect of this is the retardation of progress in important sectors, most of which cannot attain sustainability without heavy investments.

The second critical challenge is the fragmentation that has taken root in the sustainability landscape in Nigeria. While individual projects have realized successes, there has been no coordination at both national and regional levels that will scale up and make their activities replicable. For instance, most of the renewable energy projects are plagued with logistic and infrastructural problems that integrated planning and financing would ensure are mitigated. Similarly, sustainable agriculture and waste management initiatives are not reaching a critical mass due to inadequate funding and weak market linkages. Hilariously, the underfunding has hit the agricultural sector, which contributes about 24% of Nigeria's GDP, with less than 2% of the total credit apportioned to agriculture so far in 2022 (Adegwu, 2022). All these challenges therefore have created real demands for an approach of systemic sustainability of finance that would marshal and align resources with strategic priorities.

The socio-economic dynamics in Nigeria further complicate the equation of sustainable finance. With more than 40% of the population below the poverty line, high poverty rates and income inequality in the country raise competing priorities for the limited financial resources. While ESG innovations hold a promise of long-term benefits, immediate developmental needs such as healthcare, education, and poverty alleviation often take precedence. It brings into full circle the challenge of building financial mechanisms that balance objectives in the short and the long run. For example, blended models of public, private, and philanthropic capital perhaps represent the most effective modality toward using different funding to achieve a plurality of objectives. The United Nations Development Program (UNDP) has supported models of blended finance in order to unlock billions for sustainable development in Africa.

Besides the financial barriers, there are a number of factors inhibiting the growth of ESG innovations in the regulatory environment of Nigeria: incoherent policies, bureaucratic bottlenecks, and inadequate enforcement mechanisms weaken investor confidence and scare away international funding. For instance, the lack of clear-cut guidelines on green finance and sustainability reporting diminishes the capacity of businesses to attract international capital (Adegwu, 2022). Moreover, the non-availability of tax incentives for ESG-aligned projects relative to sustainability investments in key sectors like energy and infrastructure reduces their appeal. Among others, these are some areas where regulatory gaps should be addressed to provide an enabling environment for sustainability finance to really thrive.

The global shift to sustainability creates opportunities and imperatives for Nigeria. Indeed, with international investors increasingly basing investment decisions on ESG considerations, Nigeria will benefit from adjusting its developmental agenda to recent trends. For example, it is estimated that by 2022, global assets under management in ESG funds were about $2.7 trillion, a sizeable pool of potential investment (Statista, 2023). Establishing Nigeria as a hub for West African sustainability finance would definitely attract much-needed capital to grease the wheels of its ESG innovations. But this has to be underpinned by active, concerted efforts at removing these financial and institutional barriers in its path. It shall require collaborative partnership from government, the private sector, and international organizations in mobilizing resources, capacity building, and innovation.

Sustainability finance is strong in responding to the different aspects of challenges that need to be resolved in the realm of ESG innovation. In Nigeria, because these needs are pressing and of an interdisciplinary nature, one cannot overstate the significance of finance. Sustainability finance could help bridge the gap in turning vision into implementation and create new opportunities, ensuring resilience and furthering growth on a new path. But all this will come to fruition only when financial innovation is put together with policy reform, capacity building, and stakeholder engagement. This journey to sustainability in Nigeria, as this journal will show, is about financial barriers just as much as changing to a common vision of the future.

2. Key Sustainable Innovations in Nigeria (Past 10 Years)

Innovation and a range of various projects and initiatives across sectors move Nigeria further in its stride toward sustainability. Progress will be shown in renewable energy, from waste-to-energy programs and sustainable agriculture to eco-friendly infrastructure. These new developments now show that even with low finances, Nigeria can pioneer ESG innovations within West Africa.

2.1. Renewable Energy Projects

One of the most transformative achievements in sustainability at present is Nigeria's thrust into renewable energy. This has, over the past decade, been focused on solar energy that addresses energy poverty in hard-to-reach communities; solar mini-grids and decentralized renewable systems could provide electricity to unserved communities and reduce the use of diesel fuel. Cleaner energy alternatives like LPG offer a low-carbon alternative to biomass and kerosene. Initiatives like the National LPG Expansion Plan create infrastructure and incentives to increase adoption (Adebiyi, 2024). That will, again, require investment in research and policies to drive the adoption of renewable energy, including tax rebates for the installation of solar panels. The Nigeria Energy Transition Plan aims for net-zero emissions by 2060, underlining renewable energy, cleaning up oil technologies, and public-private collaboration. Lumos, a leading solar power company, installed solar home systems across Nigeria and enabled off-grid households to harness affordable and reliable electricity. Lumos (2023) evidence that enabled in the off-grid space for many years, as of 2023, Lumos is able to provide energy solutions for over 150,000 homes, impacting more than 750,000 people, serving to reduce reliance on kerosene and diesel generators, lowering greenhouse gas emissions, and promoting cleaner air.

Similarly, the Nigerian Electrification Project (NEP), which was launched in partnership with the World Bank, has been increasing access to electricity through solar mini-grids and stand-alone solar systems. By 2022, the project had connected over 300,000 people to clean, sustainable energy, while it ambitiously seeks to connect 500,000 households by 2025 (Olowosejeje et al., 2019). The initiative enhances energy access and supports local businesses through a reduction in energy costs and boosts productivity. The success of NEP indicates the role that could be played by renewable energy in pursuing economic growth with environmental sustainability in Nigeria.

Recently, wind energy has also become a focus area as hitherto untapped wealth. In its infancy, starting points are pilot projects of the likes in Katsina State, which integrate wind power into the country's energy mix. The Katsina Wind Farm is indeed a flagship project with an installed capacity of 10 MW in the country that showcases a path toward diversification (Olowosejeje et al., 2019). This would complement the solar initiatives through strategic investment in wind energy toward ensuring a more stable and sustainable energy supply.

2.2. Waste-to-Energy Programs

The country produces about 32 million tonnes of waste annually, out of which only 20% is collected and managed. In an effort to meet this challenge, waste-to-energy programs have been introduced as a panacea. For instance, the Lagos State Government's partnership with WestAfricaENRG has revolutionized the process of waste management by converting municipal solid waste into energy (Ogungbangbe, 2024). Over 700,000 tonnes of waste have been treated since 2015, with the production of electricity to power the communities and reducing reliance on landfills.

Another flagship project is the Abuja Green Waste Management Program, which combines waste recycling with energy production. This program employs over 500 individuals and has reduced landfill waste by 15% in the Federal Capital Territory. Converting organic waste into biogas and organic fertilizers, this initiative covers two pressing needs: waste management and renewable energy for agriculture (CoM SSA, 2023). The scalability of such programs presents a critical opportunity for Nigeria to meet its energy needs while reducing its environmental footprint. Additionally, AI-powered tools can aggregate information from IoT sensors on oil rigs to satellite images to government databases. These tools will also ensure consistency, reduction of human error, and speed in reporting (Adebiyi , 2024). For instance, satellite-based AI solutions track oil spills or deforestation taking place around energy projects for ESG reports in real time.

Other critical areas that are gaining momentum include e-waste management. Programs related to the recycling of electronic waste, such as the E-Terra Technologies Recycling Program, render the toxic material found in discarded devices less harmful (E-Terra , 2024). Since the program's inception, it has been able to process over 100,000 tonnes of e-waste, thus contributing toward environmental sustainability and creating jobs within urban centers.

2.3. Sustainable Agriculture and Smart Farming

Agriculture contributes 25% of the GDP and engages more than 70% of the rural population (Adegwu, 2022). Most of these traditional farming methods have been at the expense of the environment and productivity. The introduction of sustainable agriculture through smart farming techniques has brought in optimization in resource use with a minimum environmental impact. For instance, the Nigeria Climate-Smart Agriculture Project has focused on raising crop yields, not at the expense of the natural resource base. So far, it has trained over 50,000 farmers to date on resilient climate practices such as precision irrigation, agroforestry, and organic farming (Adegwu, 2022). Accordingly, this has increased their productivity by 30%, with a 20% reduction in water usage. Accomplishing these improvements had helped achieve two of the more important challenges in agriculture: food security and rural economic development.

Similarly, Hello Tractor is a Nigerian agri-tech company that disrupted mechanized farming with its mobile platform, connecting farmers in need of such services with tractor owners. To date, it has cultivated over 1.5 million hectares of farmland for more than 500,000 smallholder farmers. Hello Tractor promotes sustainable food production and contributes to the development of the rural economy by raising efficiency and reducing the cost of labor (Hello Tractor, 2019). This has gone a long way to attracting international partnerships with the platform, a testament that technology-driven solutions can alter the agricultural landscape in Nigeria.

In addition to smart farming, sustainable agriculture initiatives have encouraged crop diversification and integrated management of pests. There is also the Nigeria Zero Hunger Initiative that has motivated farmers to adopt environmentally friendly techniques in increasing food production at local levels. This reduces dependence on chemical fertilizers and pesticides to improve soil health for long-term agricultural sustainability.

2.4. Advances in Eco-Friendly Infrastructure

Another critical area of improvement is in the building of ecologically friendly infrastructure, where Nigeria has made several improvements. In most urban areas within Nigeria, there is an increasing application of green building technologies. The Green Building Nigeria Initiative promotes energy-efficient design, renewable materials, and systems that conserve water. One such landmark project was the first certified green building in Nigeria, Nestoil Tower, located in Lagos, which was completed in 2015. It had energy-efficient lighting, solar panels, and rainwater harvesting systems that reduced its impact on the environment. Eco-friendly housing projects like Abuja Green City are looking toward providing sustainable living spaces while trying to solve the housing deficit (HOF City Estate, 2024). These all give indications of how sustainability might be inculcated into urban planning and development.

Transportation infrastructure has also gone greener, with the inclusion of the Lagos Bus Rapid Transit system. Inaugurated in 2008 and extended over the last ten years, it reduces congestion and greenhouse gas emissions by offering efficient public transportation. In 2023, the system serves more than 500,000 commuters daily, and its extension is foreseen to cover growing demand. The addition of electric buses to the BRT fleet further underlines the commitment of Nigeria to green transportation solutions (Smith, 2024). Other infrastructure improvements also involve water and sanitation projects that aim to provide access to clean water and reduce the wasting of water. To this effect, the Integrated Water Resource Management Project by the Ogun State Water Corporation increased supply to over 1 million people, thereby improving the general outlook of efficient use of the resource. This helps avert critical public health problems and fosters sustainable urban development.

3. Challenges and Opportunities

These few examples, however, illustrate a promising future for Nigeria. The same are difficult to scale due to financial and institutional barriers: for example, high interest rates and perceived investment risk make access to finance too expensive for most renewable energy projects. Another challenge facing waste-to-energy programs is large capital investment, which is difficult to find within the confines of Nigeria's financial system. It gets even worse in cases of inconsistent policies and regulatory frameworks (Green Climate Fund, 2019). Without directives on green finances and sustainability reporting, for instance, businesses can have quite a headache trying to raise capital from the world over. Forcing tax incentives for projects aligned to ESG rather makes investments on the outlook of sustainability less inviting. Therefore, addressing regulatory gaps will have to hold the key towards creating enabling opportunities towards sustainable development.

However, it is still a fertile area for growth. Scaling can be done through the pursuit of international mechanisms for funding, such as the Green Climate Fund and the Global Environment Facility. PPPs can also leverage private sector competencies and finance to complement government initiatives (Green Climate Fund, 2019). Financial constraints are just one part of what Nigeria needs to overcome for its sustainability innovations to reach their full potential; encouraging collaboration is another.

Over the last decade, Nigeria has pursued a path of sustainable development characterized by remarkable successes in renewable energy, waste-to-energy programs, sustainable agriculture, and eco-friendly infrastructure. These innovations not only address pressing environmental and social challenges but also position Nigeria as a leader in ESG innovation within West Africa. However, realizing the full potential of such innovations requires overcoming financial hurdles coupled with creating an enabling environment for sustainable development. With sustainable finance, Nigeria will be leading and setting up the pace in collaboration strategies toward a greener and more inclusive future.

3.1. Financial Challenges Hindering Expansion

While the sustainability initiatives in Nigeria have huge potential for transformation, it is nonetheless faced by financial challenges. It limits not only the scaling up of the existing projects but also the establishment of new ventures for ESG objectives. This section looks into critical financial challenges that act as barriers to the development of ESG innovations within Nigeria, using statistical data and justifying such contexts.

3.2. Limited Access to Green Finance and Sustainable Investment Funds

One of the most critical obstacles that hinders ESG innovation in Nigeria is the limited availability of green finance and/or sustainable investment funds. Green finance refers to financial mechanisms that target supporting projects on sustainable development, including renewable energy, waste management, and environment-friendly infrastructure. However, available funds in Nigeria are far below what is required to meet the needs. For example, in 2023, the Climate Bonds Initiative reported that, from the total outstanding bonds in the global green bond market, Africa accounted for just 0.3%, while Nigeria accounted for a fraction of that. Whereas Nigeria actually issued its first sovereign green bond in 2017, raising $29.7 million for renewable energy and afforestation projects, the scale of funding compared to the needs of this country is small(Climate Bonds Initiative, 2023). With estimates showing that Nigeria requires up to $100 billion annually to bridge its yawning gap in infrastructure, most of which involves ESG-aligned initiatives, the gap between demand for and supply of green finance has underlined the urgent requirement for innovative financial instruments and policies that will attract domestic and international investment.

3.3. High Borrowing Costs and Risk Perception of ESG Projects

High borrowing costs remain another key factor that potentially inhibits the expansion of ESG projects in Nigeria. Double-digit interest rates in the financial system have discouraged many businesses from taking loans to finance their long-term and mostly capital-intensive sustainability projects. According to an estimate by the Central Bank of Nigeria, the average lending rate to businesses was about 22% in 2023(PWC, 2024). This rate is prohibitively high for most ESG ventures, which, by nature, require heavy upfront investment with returns only materializing over a longer period. Most ESG projects in Nigeria are generally perceived by financial institutions as high-risk investments. The root of this perception could be traced to a number of factors that include political instability, regulatory uncertainties, and underdeveloped markets for sustainable products and services. In 2022, the Nigerian Economic Summit Group, through a survey, indicated that 68% of financial institutions in Nigeria view renewable energy projects as high-risk investments owing to significant concerns on repayment capability and market viability (Nesgroup.org, 2022). This further fuels risk aversion to access to affordable financing, creating a vicious cycle hampering the growth of ESG innovations.

3.4. Lack of Institutional Support for Long-Term Investments

Additionally, there is also an absence of solid institutional support for long-term investment, seen to be one of the major impeding factors capable of expanding ESG projects in Nigeria. Institutions will, therefore, play key roles in mobilizing and channeling resources toward sustainability initiatives, especially in banks, development finance organizations, and government agencies. However, in Nigeria, these institutions often have a limited capacity, expertise, and incentives to support ESG-aligned investments effectively. For instance, the Bank of Industry (BoI) over time has initiated some support programs for renewable energy and sustainable agriculture, while the scale remains too small against emerging demand. The total amount disbursed for green projects in 2022 accounted for only an estimated $20 million, less than 0.1 percent of the aggregate funding really needed to address sustainability pursuits in the country (Stout & Meattle, 2022). And in the absence of clear-cut rules and incentives to encourage the banks to invest in ESG, this only acts to further reduce the constrained flow of capital to these vital areas.

3.5. Insufficient Public-Private Partnerships (PPPs)

Public-private partnerships (PPPs) have thus been considered effective mechanisms in the financing of large projects across the world for sustainability. They mobilize considerable financial resources by leveraging the strengths of both sectors, spreading risks, and assuring project implementation efficiency. In general, Nigeria has not been that successful either in establishing or sustaining effective PPPs within the ESG domain (PWC, 2024). A good example of this is the Abuja Green City project, which was to be an eco-friendly new urban development. Rather than being the model for West African sustainable urban planning, it has continued to face postponements due to a lack of finance and coordination between public and private stakeholders. This speaks volumes about the need for strong frameworks and incentives towards the collaboration and alignment of the interests of all parties concerned.

3.6. Currency Fluctuations and Economic Instability

Poor economic conditions and fluctuating currencies add to the financial headaches facing ESG projects in Nigeria. An already depreciated currency inflates the price at which technologies and materials needed for sustainable infrastructure and renewable energy projects are imported into the country. For example, the International Renewable Energy Agency estimated that, due to currency devaluation and increased inflation, there is a 35% increase in the import price of solar panels between the past five years and 2022 (IRENA, 2022). Apart from this, economic instability takes away investor confidence and leads to capital flight, decreasing foreign direct investment inflows (FDI). FDI inflows into Nigeria were 23% lower in 2023 compared to the previous year, with many investors pointing at economic uncertainties for their decisions (Blair, 2023). This decline has direct implications for ESG innovations, which often depend on foreign capital to supplement domestic funding.

3.7. Regulatory and Policy Gaps

Gaps in regulations and policies are also some of the key factors impeding the growth of ESG projects in Nigeria. Inadequate policies and frameworks on green finance and sustainability reporting create uncertainty that makes investors and project developers shy away from investments in such projects. For example, while the Nigerian government has put in place initiatives such as the National Renewable Energy and Energy Efficiency Policy, the implementation and enforcement of these policies remain inconsistent. A 2022 report from PwC Nigeria highlighted that 72% of the responding businesses regarded regulatory inconsistencies as a major hindrance to investments in sustainability (PwC, 2023). It also noted that without any form of tax incentives, the lack thereof with respect to ESG-aligned projects further undermines their viability. Such regulatory and policy lacunas need to be addressed to give way to an enabling environment for sustainability finance in Nigeria.

3.8. Limited Awareness and Capacity

Furthermore, limited awareness and capacity among key stakeholders are also contributing to this financial barrier of ESG projects in Nigeria. Due to the dearth of knowledge and skill sets required to develop bankable sustainability projects and access the growing green finance landscape, many companies, especially SMEs, have been restricted to a small area. Similarly, most financial institutions lack the inbuilt capacity for proper risk assessment to seize emerging opportunities linked to ESG (Obaisa-Osula et al., 2023). The necessity, therefore, arises for capacity-building programs, which involve training of the financial institutions in ESG risk assessment and development of sustainability-linked financial products. This further enhances their capabilities to support green projects. Awareness campaigns on available funding opportunities and, simultaneously, technical assistance for enhancing the bankability of the projects would be some other necessary steps.

Financial bottlenecks to scaling up ESG innovations in Nigeria are multifaceted and inculcated. Limiting green finance, high costs of borrowing, institutional non-support, lack of PPPs, economic instability, regulatory lacuna, and limited capacity together paint a discouraging outlook toward the initiatives of sustainability-related propositions. Such challenges will need systemic addressing through coordination by all parties involved: government, the private sector, and the international community, one way or another (Obaisa-Osula et al., 2023). Thus, targeted interventions, such as policy reforms, capacity-building programs, and innovative financial instruments, could help Nigeria overcome some of these barriers to unlock the full potential of sustainability finance. The benefits of taking this direction are not limited to environmental and social impacts alone but extend to increased economic resilience, job creation, and improvement in global competitiveness. These are financial challenges that need to be addressed if Nigeria is going to position itself as a leader in sustainable development within West Africa, but they also offer an opportunity.

4. Opportunities and Recommendations

While the ESG journey to sustainable development in Nigeria is replete with financial challenges, it also presents vast opportunities. Addressing these challenges will unlock the opportunities for sustainability financing and spur the nation toward a future of inclusive economic growth with environmental resilience and social equity. This section discusses the critical opportunities to improve access to sustainability finance and gives policy reform recommendations and private sector interventions to spur investments into ESG projects.

5. Opportunities to Improve Access to Sustainability Financing

The most critical opportunities include drawing on Nigeria's strategic positioning as a regional leader for West Africa, with substantial natural resources, an emergent technology sector, and a growing population of youthful, innovative entrepreneurs, a sound foundation on which to anchor sustainability-oriented investment. In this direction, Nigeria needs to position itself strategically to attract domestic and international financing.

5.1. Green Bonds and Climate Finance

Green bonds have indeed emerged as a robust capital-raising instrument with ring-fencing in the global market for funding environmental projects. The sovereign bond that Nigeria issued for the first time in 2017 fetched $10.69 million for the renewal of energy and afforestation initiatives (Jones, 2023). This successful subscription has underlined the upside that is possible to upscale further in green bond issuances, thereby financing general initiatives relating to ESG. The Climate Bonds Initiative said the world's green bond market crossed the threshold of $1.5 trillion by 2022, an important avenue through which Nigeria could tap into international climate finance (Jones, 2023). The growth of Nigeria's green bond market would attract investment from environmentally conscious global stakeholders and improve funding gaps in key sectors of ESG.

5.2. Public-Private Partnership

PPPs could act as a channel for the mobilization of private capital for large projects on ESG. For example, the "Solar Power Naija" solar energy project under the Economic Sustainability Plan intends to electrify 5 million households via PPPs. Upscaling those models will lead to investing in sustainable infrastructure, waste management, and renewable energy projects. According to research by the International Renewable Energy Agency, it could see the cost of electricity go down as high as 30%, hence making projects financially viable to resolve the energy crisis in Nigeria(IRENA, 2022).

Digital Financial Inclusion: Better fintech could hold enormous promise for democratizing access to financing for sustainability. For example, Farmcrowdy and ThriveAgric have previously succeeded in matching investors with smallholder farmers to provide sustainable agriculture. Thus, the ability to scale such platforms to include ESG-focused initiatives would go a long way toward improving small-scale innovators' access to finance. According to the Central Bank of Nigeria, fintech platforms reached $12 billion in value of transactions in 2021 alone, underlining their growing power in the financial ecosystem (Diya et al., 2021). This success was extended to one Oritsemolebi whose work into the bursting ecosystem of Nigeria's fintech, where she partnered with a number of leading companies to leverage impact investments. Equipped with her knowledge, such organizations attracted transformative funding, increased their operations, and adapted innovative practices that would match the sustainable development goals (Olaniyi, 2021). Her commitment to empowering businesses with actionable insights and financial strategies continues to shape their success and long-term sustainability.

Regional Collaboration: Nigeria's leadership in the Economic Community of West African States (ECOWAS) creates avenues for regional sustainability finance mechanisms. Resources can be pooled into cross-boundary ESG projects such as renewable energy grids or sustainable water management systems, hence achieving economies of scale, reducing investment risks. Other regional initiatives, such as the West African Power Pool, illustrate that collaboration is workable on a regional scale to solve some large environmental problems.

Blended Finance Models: Blended finance pools the resources of public, private, and philanthropic sources to de-risk the investments and draw in private capital to ESG investments. As claimed by the Global Impact Investing Network, globally over $140 billion mobilized to support development through blended finance structures (Afdb.org, 2020). Nigeria can use this for areas of critical funding mismatch. For instance, the introduction of blended finance mechanisms in renewable energy could raise installed capacity by as high as 50%, according to projections by the African Development Bank (Afdb.org, 2020).

6. Recommendations for Policy Reforms

6.1. Develop a Comprehensive Green Finance Framework

The government should develop an all-inclusive green finance framework that would lead to a better foundation for sustainability financing in Nigeria. The framework would include clear policy and guiding principles on green investments, tax incentives, subsidies, and grants customized for the ESG project. The introduction of mandatory sustainability reporting for businesses would further add to increased transparency and more impact investors. This policy holds immense transformative potential, evidenced by data from the United Nations Environment Programme, which indicates a 20% increase in green investments in countries with mandatory green reporting (UNEP, 2021).

Therefore, this framework will also gain by having at its center an established centralized green finance authority that shall coordinate all financial activities with ESG dimensions. This could be in streamlining applications for funding, feasibility studies of the projects, and matching the local investors with international investors. Evidence from emerging markets suggests that such a body could reduce the time for processing ESG project loans by up to 40%, thus reducing execution time drastically. It should also spell out in the framework capacity-building programs for financial institutions themselves to enhance their understanding and due diligence on ESG projects, so as to reduce the perception of risk associated with those projects.

6.2. Strengthen Financial Institutions

Strengthening financial institutions is important in facilitating Nigeria's effective ESG project financing. The role of local banks has to be more capable of understanding and appraising ESG projects for better credit availability, reducing financial obstacles for sustainability projects. Training and workshops on ESG evaluation methodologies should help equip the financial institutions with tools needed to better support green projects. For instance, approved ESG loans increased by 25% in countries where this training was imparted, according to the International Finance Corporation (IFC, 2019). Thus, a separate green finance body or a department in existing financial bodies can ensure faster financing of ESG projects. It would make the processing of the application related to ESG projects easy and quick. Evidence provided by the World Bank shows that such institutional strengthening can cut loan processing time by up to 40%, giving a fillip in terms of project implementation pace(UNEP, 2021). These specialized entities could also act as intermediaries, bridging the gap between international investors and local ESG projects, thereby improving trust and transparency. The empowered participation of financial institutions in Nigeria for sustainability financing could result in raising a strong ecosystem in support of growth and expansion for ESG innovation.

6.3. Incentivize Private Sector Participation

Encouragement of the private sector to be active in ESG financing is important for sustainable growth in Nigeria. The risk-sharing mechanisms, such as partial credit guarantees, would reduce the financial burden and perceived risks by private investors, hence making the projects on sustainability more attractive. Besides, a reduced corporate tax rate should be applied to companies investing in green initiatives as a way of stimulating private sector involvement. For example, a report by PwC shows that these fiscal incentives even raise the participation of companies in green projects by 35%, thus proving them to be truly effective means of mobilizing private capital (PwC, 2023). It will also create platforms that allow regular public-private dialogues on ESG financing and offer opportunities for unique partnerships, calling for shared responsibility. Besides, green investment funds, contributed to by both the private and public sectors, will be instrumental in the development of high-priority sectors such as renewable energy, sustainable agriculture, and eco-friendly infrastructure. These strategies will not only ease the financial burden but also create an ecosystem where the private sector becomes the major driver for ESG transformation in Nigeria.

6.4. Enact Policy Harmonization

This means the integration of sustainability objectives into national budget planning is simply the institutionalization of financing for sustainability. For instance, a green budget framework has achieved a 25% improvement in the efficiency of the use of resources in South Africa; hence, similar approaches taken on board in Nigeria can ensure full utilization to meet the country's resource requirements on sustainability objectives commensurate with its economic priorities (UNEP, 2021).

6.5. Enhance International Collaboration

Participation in international sustainability platforms like the United Nations' Green Climate Fund or the African Development Bank's Climate Investment Funds can offer avenues leading to concessional funds. Smoothening of the bilateral relationship with those countries that are ahead in ESG financing will help in knowledge transfer and eventual investment inflow. The OECD estimates that international collaboration can raise green financing by as high as 15% per year in developing countries (OECD, 2024).

7. Recommendations for Private Sector Interventions

7.1. Promote Corporate Social Responsibility (CSR)

Encouragement in the form of aligning CSR strategies of businesses with ESG goals can mobilize more resources toward sustainable development. Giving awards or even tax rebates to companies that display ESG excellence can initiate other companies emulating those sustainable practices (Netshifhefhe et al., 2024).

7.2. Support Impact Investing

Impact investment funds created for specific sectors, for example, renewable energy, waste management, or agriculture, can mobilize private capital toward high-impact projects. Instead, impact investments focus on measurable social and environmental outcomes, often on par with financial returns, unlike traditional financing models. For a country like Nigeria, with its high dose of entrepreneurial spirit, rich natural resources, and energetic youth population, such financing could open up new windows of opportunities for SMEs and usher in inclusive, sustained development (Adebiyi, 2020). This may be potentially complemented by cooperation with venture capital companies on incubation initiatives that help bring new ESG-oriented startups to market faster. According to a study done by the African Venture Capital Association, impact-focused startups attracted 45% more funding than traditional ventures in similar markets (AVCA, 2023).

7.3. Develop Sustainable Supply Chains

Encouraging companies towards sustainable procurement practices can hence spur demand for ESG-compliant products and services and encourage investment in the sector. The development of green certification programs may inspire suppliers to adhere to established standards in sustainability. Efficiency in distribution chains is thus important for economic growth in West Africa, since the impacts of such efficiency levels will directly relate to the trade performance of the region and generally its economic sustainability (Lawrence & Mupa, 2024b). Efficient supply chains not only support better operational outcomes but also enhance employee satisfaction and enterprise performance, as evidenced by the adoption of green supply chain management practices in South Africa's mining sector. Similar strategies applied in West Africa could therefore lead to improved efficiency in distribution and contribute a great deal to the economic development of the region. One such strategy can be applied is lean supply chain management, the application of lean methodologies in procurement would relate to the identification and elimination of non-value-adding activities, reduction in lead times, and developing better relationships with suppliers. Lean methodologies in procurement reduce waste by streamlining operations, consolidating suppliers, and deploying technology that automates the routine stuff (Lawrence & Mupa, 2024a). As part of a lean procurement exercise, leading oil and gas companies have achieved marked enhancement in their supply chain performance, deriving benefits that include cost reduction, improved delivery times, and enhanced supplier partnerships.

The proposed opportunities and recommendations were done in line with globally accepted best practices, working within the socio-economic peculiarities of Nigeria. For instance, a case for green bond expansion is supported by remarkable demand for climate finance across the globe. According to estimates by the African Development Bank, Africa needs $3 trillion by 2030 in order to attain its goals on sustainability; hence, innovative financing mechanisms are needed. On another level, PPP and blended finance models can de-risk the high-risk perception of ESG projects in Nigeria. Such models make use of public funds to de-risk private investments and, as such, unleash billions of dollars toward sustainable development (Zhuwankinyu et al., 2024). The success of Solar Power Naija gives credence to the fact that such approaches are feasible, while replication across other sectors will further establish it as the veracity. Financial institution policy reforms and regulatory framework reforms are in order to make the enabling environment possible for sustainability financing. According to the World Bank, improved regulatory clarity may attract up to 30% more foreign direct investment in emerging markets. A strong green finance framework will similarly increase investor confidence in Nigeria.

Private sector interventions remain key, mainly in the areas of CSR and impact investing, in bridging funding gaps. The Global Impact Investing Network estimates that impact investments in Sub-Saharan Africa reached a total of $4.8 billion in 2020, indicating huge, untapped potential for private capital in the region (Olawuyi & Oche, 2022). This would be further amplified if such businesses were encouraged to consider ESG within the operational framework. Finally, living by the spirit of evolution in today's digital world just means not being able to rule out the adoption of tech-enabled solutions. This therefore makes innovations address the prevailing bottlenecks and future-proof Nigeria's sustainability financing ecosystem: blockchain platforms focused on tracking the output from sustainability raise transparency and increase it, while digital marketplaces democratize access to finances. Ecosystem.

8. Conclusion

Sustainability finance can make the difference in the direction of ESG innovations in Nigeria, toward a future of environmental stewardship, social equity, and economic resilience. Against the backdrop of limited access to green finance, high borrowing costs, and institutional support, the adoption of collaborative approaches is rather indispensable. It is high time for governments, private sectors, and international stakeholders to come together in order to create an enabling ecosystem that supports sustainable growth. It would be through the adoption of novel financing mechanisms, selective policy reforms, and encouragement of private sector involvement that the current barriers to ESG performance can be overcome in Nigeria. Further underpinning Nigeria's leadership role in regional sustainability is the integration of technology, regional cooperation, and impact investment. The successful realization of this will be a collective effort and commitment to sustainability principles that will help Nigeria achieve its ESG goals for current and future generations.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

References

[1] Adebiyi, O. (2024). *Leveraging AI to enhance ESG reporting in West Africa's energy sector - Businessday NG*. Businessday NG. https://businessday.ng/opinion/article/leveraging-ai-to-enhance-esg-reporting-in-west-africas-energy-sector/?amp

[2] Adebiyi, O. (2020). *Unlocking Opportunities for SMEs through impact investments in Nigeria*. The Guardian Nigeria News - Nigeria and World News. https://guardian.ng/business-services/entrepreneur/unlocking-opportunities-for-smes-through-impact-investments-in-nigeria/

[3] Adebiyi, O. (2024). *Decarbonisation strategies for Nigeria's path to net zero*. Punchng.com. https://punchng.com/decarbonisation-strategies-for-nigerias-path-to-net-zero/

[4] Adegwu, J. (2022). *2022: Insecurity, Climate Change Threaten Nigeria's Agricultural Sector – ARCN*. Arcn.gov.ng. https://arcn.gov.ng/2022/01/11/2022-insecurity-climate-change-threaten-nigerias-agricultural-sector/

[5] Adeoye, A. (2018). *The Role Of Nigeria In The Development Of International Organizations In Africa: A Case Study Of Ecowas*. *Www.academia.edu*. https://www.academia.edu/51912659/THE_ROLE_OF_NIGERIA_IN_THE_DEVELOPMENT_OF_INTERNATIONAL_ORGANIZATIONS_IN_AFRICA_A_CASE_STUDY_OF_ECOWAS

[6] Afdb.org. (2020). *Light up and power Africa*. Afdb.org. https://www.afdb.org

[7] AVCA. (2023). *AVCA | 2023 Venture Capital in Africa Report*. AVCA. https://www.avca.africa/data-intelligence/research-publications/2023-venture-capital-in-africa-report/

[8] Blair, A. (2023). *The FDI landscape in Nigeria in 2023*. Investment Monitor. https://www.investmentmonitor.ai/features/fdi-nigeria-investment-africa-oil-gas-diversification/

[9] Climate Bonds Initiative. (2023). Sustainable Debt Global State Of The Market 2023 Green $2.8tn Sustainability $768bn SLB $48.6bn Social $821bn $4.4tn Cummulative Aligned GSS+ Prepared by Climate Bonds Initiative Sustainable Debt Global State of the Market 2023 Climate Bonds Initiative 2. https://www.climatebonds.net/files/reports/cbi_sotm23_02h.pdf

[10] *CoM SSA*. (2023). Comssa.org. https://comssa.org/en/news/transforming-abuja-innovative-waste-management-solutions

[11] Diya, O. O., Takuro, K., & Popoola, M. (2021). *Fintech Half-Year Review 2021 – Recent Regulatory And Legal Developments In Nigeria*. Www.mondaq.com. https://www.mondaq.com

[12] E-Terra . (2024). *Welcome to E-Terra Technologies Limited - Pioneers in e-waste recycling*. E-Terra Technologies Limited. https://www.eterra.com.ng/system/

[13] Fernández, L. (2024). *Topic: Global renewable energy investments*. Statista. https://www.statista.com/topics/10992/global-renewable-energy-investments/#topicOverview

[14] Green Climate Fund. (2019). *Nigeria*. Green Climate Fund. https://www.greenclimate.fund/countries/nigeria

[15] Gunda, V. N., & Mupa, M. N. (2024). *A Paradox in Human Resources: Automation Vs Human Capital. IRE Journals*, *8*(6), 644–653. https://www.irejournals.com/paper-details/1706752

[16] Hello Tractor. (2019). *Digital Tech: The Future of Agriculture in Africa | Hello Tractor*. Hellotractor.com. https://hellotractor.com/digital-tech-the-future-of-agriculture-in-africa/

[17] HOF City Estate. (2024). *HOF City Estate - Your Gateway To Sustainable Living*. Techsphere Property Abuja. https://techsphere.com.ng/hof-city/

[18] IFC. (2019). *ESG loans*. Ifc.org. https://www.ifc.org/

[19] International Energy Agency. (2017). *Universal energy access by 2030 is now within reach thanks to growing political will and falling costs - News*. IEA. https://www.iea.org/news/universal-energy-access-by-2030-is-now-within-reach-thanks-to-growing-political-will-and-falling-costs

[20] IRENA. (2022). *Renewable Energy Statistics 2022*. /Publications/2022/Jul/Renewable-Energy-Statistics-2022. https://www.irena.org/publications/2022/Jul/Renewable-Energy-Statistics-2022

[21] Jones, L. (2023). *Global State of the Market Report 2022*. Climate Bonds Initiative. https://www.climatebonds.net/resources/reports/global-state-market-report-2022

[22] Lawrence, S. A., & Mupa, M. N. (2024a). Organizational Efficiency as an Instrument of Improving Strategic Procurement in West Africa through Lean Supply Management. IRE Journals, 8(4), 262–285. https://www.irejournals.com/paper-details/1706399

[23] Lawrence, S. A., & Mupa, M. N. (2024b). Supply Chain Tools and Its Central Importance to Distribution Chain Efficiency in West Africa: Nigeria and Ghana as Case Studies. 8(4), 286–307. https://www.researchgate.net/publication/385079961_Supply_Chain_Tools_and_Its_Central_Importance_to_Distribution_Chain_Efficiency_in_West_Africa_Nigeria_and_Ghana_as_Case_Studies

[24] Lumos. (2023). *From Generators to Solar Energy: the Power Revolution is Here*. Lumos Global. https://www.lumos-global.com/post/from-generators-to-solar-energy-the-power-revolution-is-here

[25] Nesgroup.org. (2022). *The Nigerian Economic Summit Group | Energy Policy Commission*. Nesgroup.org. https://nesgroup.org/policycommissions/energy

[26] Netshifhefhe, K., Netshifhefhe, M. V., Mupa, M. N., & Murapa, K. A. (2024). Integrating Internal Auditing and Legal Compliance: A Strategic Approach to Risk Management. *IRE Journals*, *8*(4), 446–465. https://www.irejournals.com/paper-details/1706421

[27] Obaisa-Osula, M., Adepoju, T., Ogunlowo, T., & Arogie, M. (2023). *2022 Survey of Sustainability Reporting in Nigeria - KPMG Nigeria*. KPMG. https://kpmg.com/ng/en/home/insights/2023/01/2022-survey-of-sustainability-reporting-in-nigeria.html

[28] OECD. (2024). *Integrating climate action into development finance*. OECD. https://www.oecd.org/en/publications/integrating-climate-action-into-development-finance_41d16c83-en.html

[29] Ogungbangbe, I. J. (2024). *Nigeria: Lagos Unveils Waste-to-Energy Plant to Power 40,000 Homes*. Energy News Africa Plus. https://energynews.africa/2024/05/30/nigeria-lagos-unveils-waste-to-energy-plant-to-power-40000-homes/

[30] OKEKE, A. (2024). The Influence Of Esg-Driven Lending On Banking Sector Dynamics In Nigeria. Mendeley Data, 1. https://doi.org/10.17632/fr7ynxfdjd.1

[31] Olaniyi, K. (2021). *Oritsemolebi Adebiyi: Driving sustainable finance and SME growth in Nigeria*. The Guardian Nigeria News - Nigeria and World News. https://guardian.ng/opinion/oritsemolebi-adebiyi-driving-sustainable-finance-and-sme-growth-in-nigeria/#google_vignette

[32] Olawuyi, D. S., & Oche, A. (2022). WEF Nexus and Sustainable Investments in West Africa: The Case of Nigeria. *Sustainable Development Goals Series*, 243–258. https://doi.org/10.1007/978-3-031-05472-3_13

[33] Olowosejeje, S., Leahy, P., & Morrison, A. (2019). The economic cost of unreliable grid power in Nigeria. *African Journal of Science, Technology, Innovation and Development*, *11*(2), 149–159. https://doi.org/10.1080/20421338.2018.1550931

[34] PWC. (2024). PwC: Building relationships, Creating Value. PwC. https://www.pwc.com

[35] PwC. (2023). *Insights and publications*. PwC. https://www.pwc.com/ng/en/publications.html

[36] Smith, O. (2024). Updates: Expansion of Electric Buses in BRT Fleet, 2023 Rail Statistics, 3rd Mainland Bridge Bus Crash, Lagos-Calabar Coastal Highway Toll Gate - DAX Street. DAX Street. https://daxstreet.com/news/166336/updates-expansion-of-electric-buses-in-brt-fleet-2023-rail-statistics-3rd-mainland-bridge-bus-crash-lagos-calabar-coastal-highway-toll-gate/

[37] Statista. (2023). *Sustainable funds AUM allocation worldwide 2022*. Statista. https://www.statista.com/statistics/1319691/sustainable-funds-aum-global-allocation/

[38] Stout, S., & Meattle, C. (2022). *Landscape of Climate Finance in Nigeria*. CPI. https://www.climatepolicyinitiative.org/publication/landscape-of-climate-finance-in-nigeria/

[39] UNEP. (2021). *World needs USD 8.1 trillion investment in nature by 2050 to tackle triple planetary crisis*. UN Environment. https://www.unep.org/news-and-stories/press-release/world-needs-usd-81-trillion-investment-nature-2050-tackle-triple

[40] Uwadoka, R. (2023). *Sustainable Finance in Nigeria: A Case for its Development*. TNP. https://tnp.com.ng/insights/sustainable-finance-in-nigeria-a-case-for-its-development

[41] Zhuwankinyu, E. K., Moyo, T. M., & Mupa, M. N. (2024). Leveraging Generative AI for an Ethical and Adaptive Cybersecurity Framework in Enterprise Environments. *IRE Journals*, *8*(6), 654–675. https://www.irejournals.com/paper-details/1706753

[42] Ogungbangbe, I. J. (2024). *Nigeria: Lagos Unveils Waste-to-Energy Plant to Power 40,000 Homes*. Energy News Africa Plus. https://energynews.africa/2024/05/30/nigeria-lagos-unveils-waste-to-energy-plant-to-power-40000-homes/

[43] OKEKE, A. (2024). The Influence Of Esg-Driven Lending On Banking Sector Dynamics In Nigeria. Mendeley Data, 1. https://doi.org/10.17632/fr7ynxfdjd.1

[44] Olawuyi, D. S., & Oche, A. (2022). WEF Nexus and Sustainable Investments in West Africa: The Case of Nigeria. *Sustainable Development Goals Series*, 243–258. https://doi.org/10.1007/978-3-031-05472-3_13

[45] Olowosejeje, S., Leahy, P., & Morrison, A. (2019). The economic cost of unreliable grid power in Nigeria. *African Journal of Science, Technology, Innovation and Development*, *11*(2), 149–159. https://doi.org/10.1080/20421338.2018.1550931

[46] PWC. (2024). PwC: Building relationships, Creating Value. PwC. https://www.pwc.com

[47] PwC. (2023). *Insights and publications*. PwC. https://www.pwc.com/ng/en/publications.html

[48] Smith, O. (2024). Updates: Expansion of Electric Buses in BRT Fleet, 2023 Rail Statistics, 3rd Mainland Bridge Bus Crash, Lagos-Calabar Coastal Highway Toll Gate - DAX Street. DAX Street. https://daxstreet.com/news/166336/updates-expansion-of-electric-buses-in-brt-fleet-2023-rail-statistics-3rd-mainland-bridge-bus-crash-lagos-calabar-coastal-highway-toll-gate/

[49] Statista. (2023). *Sustainable funds AUM allocation worldwide 2022*. Statista. https://www.statista.com/statistics/1319691/sustainable-funds-aum-global-allocation/

[50] Stout, S., & Meattle, C. (2022). *Landscape of Climate Finance in Nigeria*. CPI. https://www.climatepolicyinitiative.org/publication/landscape-of-climate-finance-in-nigeria/

[51] UNEP. (2021). *World needs USD 8.1 trillion investment in nature by 2050 to tackle triple planetary crisis*. UN Environment. https://www.unep.org/news-and-stories/press-release/world-needs-usd-81-trillion-investment-nature-2050-tackle-triple

[52] Uwadoka, R. (2023). Sustainable Finance in Nigeria: A Case for its Development. TNP. https://tnp.com.ng/insights/sustainable-finance-in-nigeria-a-case-for-its-development

[53] Zhuwankinyu, E. K., Moyo, T. M., & Mupa, M. N. (2024). *Leveraging Generative AI for an Ethical and Adaptive Cybersecurity Framework in Enterprise Environments*. *IRE Journals*, *8*(6), 654–675. https://www.irejournals.com/paper-details/1706753