



GREEN FINANCE AND ENVIRONMENTAL SUSTAINABILITY: IMPLICATIONS FOR SUSTAINABLE DEVELOPMENT GOALS

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Global Authors Publication

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Preface

The global pursuit of sustainable development has entered a critical phase, where the interplay between finance, technology, and environmental stewardship determines the pace and quality of progress. At the center of this transition lies green finance, an emerging paradigm that aligns financial flows with environmentally responsible investments, social equity, and long-term economic resilience. The title of this volume, *Green Finance and Environmental Sustainability: Implications for Sustainable Development Goals*, reflects the urgent need to rethink how capital is mobilized, distributed, and managed in pursuit of the SDGs.

This book brings together diverse scholarly perspectives that examine the opportunities, challenges, and pathways for embedding green finance into the broader sustainability agenda. From the integration of fintech, blockchain, and digital innovations in green financing systems to the role of circular economy practices, ESG reporting, and transparency frameworks, the chapters offer comprehensive insights into how finance can be restructured to address climate change, biodiversity loss, resource depletion, and urban sustainability challenges.

The volume also engages with critical debates such as greenwashing, regulatory interventions, and the measurement of impact, while extending the discussion into practical domains like real estate financing, agricultural sustainability, renewable energy systems, and entrepreneurship for poverty reduction. In doing so, it highlights how green finance is not only a tool for environmental protection but also a catalyst for inclusive socio-economic development.

What distinguishes this collection is its interdisciplinary scope. Contributions range from economics, finance, and policy studies to environmental sciences and information management,

reflecting the multifaceted nature of sustainability. Together, these perspectives illuminate how financial mechanisms can be transformed into powerful instruments for achieving the SDGs, particularly in the context of emerging economies such as Nigeria, where the urgency of climate and development challenges converge.

This book is intended for scholars, policymakers, practitioners, and students who seek to understand and engage with the evolving landscape of green finance. It provides both conceptual clarity and empirical depth, offering not just theoretical reflections but also practical recommendations that can guide future policies, business strategies, and community actions.

As editors, we hope this volume contributes meaningfully to the ongoing global dialogue on sustainability. More importantly, we aspire that it inspires innovative, ethical, and transformative approaches to finance—approaches that prioritize the planet and people alongside profit.

Editorial Notes

The present volume brings together a diverse collection of scholarly works that collectively illuminate the dynamic intersections of green finance, sustainability, and innovation in shaping a resilient future for Nigeria and other emerging economies. As the global discourse on climate change, environmental stewardship, and financial responsibility intensifies, this book provides a timely intellectual contribution to both policy and practice.

The chapters open with explorations into the transformative role of fintech, blockchain, and digital green finance in advancing sustainable port management, setting the stage for how technology can act as a driver of inclusive and eco-friendly financial systems. The volume then delves into pressing themes such as circular economy practices, resource management, and sustainable real estate development, offering frameworks that align economic growth with environmental responsibility.

A critical concern reflected in these works is the problem of greenwashing and the need for transparency in green finance, explored across multiple contributions. These discussions underscore the importance of trust, accountability, and proper reporting through ESG metrics, SDG-aligned indicators, and impact measurement tools. The research also interrogates the roles of policy and regulatory frameworks, stressing how institutional and governmental interventions are essential in mobilizing capital toward climate-aligned development goals.

Unique perspectives are presented on the ecological front, with chapters that connect soil health, nematodes, agricultural sustainability, and bio-digester innovations, showing how environmental science and finance can mutually reinforce each other. Similarly, contributions on net-zero

emission pathways, entrepreneurship, poverty reduction, and fintech business growth highlight the inclusive potential of green finance in driving both environmental and socio-economic transformation.

Importantly, this collection goes beyond conventional boundaries by including insights from library and information science in developing taxonomies for sustainability standards—an interdisciplinary approach that enriches the conversation. Together, the works provide a holistic vision, addressing historical roots, contemporary challenges, and forward-looking policy pathways toward a more sustainable and just future.

As editors, we view this book not merely as an academic exercise but as a call to action for policymakers, researchers, financiers, entrepreneurs, and communities. By bridging theory and practice, evidence and policy, it provides a knowledge base to reimagine financial systems as instruments of sustainability rather than extractive growth.

We extend our appreciation to the contributing authors for their insightful research, and to the readers who will carry forward these conversations into their fields of influence. It is our hope that this volume inspires practical innovations, ethical financial practices, and transformative policies that contribute to achieving sustainability, inclusivity, and resilience in Nigeria and beyond.

Editors

Sri. ARIJIT Chakraborty

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Prof. Muftau Adeniyi IJAIYA

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INTRODUCTION OF EDITOR- IN-CHIEF



Arijit Chakraborty is an eminent author, academician, researcher, economist, social scientist, and editor. He earned two Master's Degree, first one in Political Science and Second one in Economics. He started his career as a guest lecturer in a government degree college and later served in many government and non-government institutions as faculty like: Government Degree Colleges Santirbazar, Kabi Nazrul Mahavidyalaya, Techno India University Tripura, School of Science (Civil Service Coaching Institution). He has authored 21 book chapters published by various national and international publishers. He has presented 24 research papers at national and international seminars and conferences. He has experience working with NABCONS (a subsidiary of the National Bank for Agriculture and Rural Development) as an economic consultant. He has also worked with reputed think tanks like ICRIER (Indian Council for Research on International Economic Relations) and associated with RIS (Research and Information System for Developing Countries).

He also has the work experience in research projects in various central Universities like: Tripura University and Assam University Silchar.

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INTRODUCTION OF EDITORS



Professor Josaphat Uchechukwu J. Onwumere is an economist and banking/finance expert. He is a Professor of Banking/Finance and Economic Development in the Department of Banking and Finance, University of Nigeria, Nsukka (UNN) (Enugu Campus), Nigeria. He was Head of Department of Banking and Finance in the University for four years (2010 – 2014) and currently is the Director, UNN Business School. Professor Onwumere attended the Holy Ghost College, Owerri; the University of Nigeria, Nsukka and the University of Jos. He is also an alumnus of the International Institute for Management Development, Lausanne, Switzerland. A consummate intellectual and technocrat, he had been a practitioner in banking, management, research, strategy and consultancy. He has banking experience spanning over twelve years at management level in the Nigerian banking industry. He was a Director General of Abuja Graduate School. A seasoned administrator, Professor Onwumere had been Chairman, Faculty of Business Administration (FBA) Time Table Committee; member, Senate Time Table Committee at the University of Nigeria; University of Nigeria Senate Representative on University of Nigeria Council Committee on Budget Monitoring; Chairman, FBA Consultancy Committee, and Chairman of many committees in the Faculty. Professor Onwumere is a continuous and committed researcher, as well as a distinguished scholar and respected intellectual with over hundred (100) publications spread across a single authored book, one co-authored book, two (2) co-edited books, one (1) co-authored monograph, contributions to manuals and chapters in books, and several articles in reputable local and international journals. He is also a consultant to some reputed

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Prof. Muftau Adeniyi Ijaiya is a member of the University of Ilorin Governing Council representing the Congregation. He graduated from Kwara State College of Education, Ilorin where he earned NCE in Geography and Economics. He later proceeded to Bayero University, Kano where he earned B. Sc. Economics and M. Sc. Banking and Finance respectively. He bagged his Ph. D. Accounting and Finance at the University of Ilorin, Nigeria. He joined the services of the University of Ilorin, in 2001 as an Assistant Lecturer and rose through the rank to the position of a Professor of Finance in 2017. Prof. Ijaiya meritoriously served as former Dean, Faculty of Management Sciences; former Deputy Director, Unilorin Consultancy Services Unit; former Acting Head, Department of Accounting and Finance; former Acting Head, Department of Finance; former Chairman, Unilorin Petrol Station Management Board; former Coordinator, Faculty Professional Programmes, and Director, Bizface Unilorin Synergy Limited, Unilorin Business Outfit. He is a Fellow of Nigerian Society for Financial Research (FNSFR); Member, Capital Market Academics of Nigeria (CMA); Member, Professional Risk Managers' International Association (PRMIA); Member, Board of Trustee, Accounting and Finance, University of Ilorin Alumni November 2003 Set; and Chairman, Board of Trustees, Government Secondary School Agbaja Old Students' Association. He is a resource person to JAMB, JUPEB, CBN

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Dr. Gbenga Festus Babarinde, an accounting, finance and capital markets expert, is a Lecturer at the Department of Banking and Finance, Modibbo Adama University, Yola, Nigeria, with over a decade's experience in teaching, research and community service. He holds a First-Class Bachelor's and Master's degree in Finance from University of Ilorin, Nigeria and a Ph.D. in Banking and Finance from

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CONTENT

1. FINTECH, BLOCKCHAIN AND DIGITAL GREEN FINANCE IN PORT MANAGEMENT: INSIGHTS FROM NIGERIA

By Mr. Akinpelu Ayobami KOLAD.....1 -16

2. CIRCULAR ECONOMY AND SUSTAINABILITY RESOURCES MANAGEMENT

By Dr. Taiwo IBITOMI & Angel Ochoyoda AMEH 17-38

3. GREENWASHING AND TRANSPARENCY ISSUES IN GREEN FINANCE

By Ibrahim Buhari & Tanimu Abubakar..... 39-59

4. GREEN REAL ESTATE FINANCING AS A CATALYST FOR SUSTAINABLE URBAN DEVELOPMENT IN EMERGING ECONOMIC

By Patience Osaiwie Iruobe 60-89

5. MEASURING IMPACT: ESG REPORTING, SDG METRICS, AND KPIs

By Dr. Gladys Chiebonam Onuigwe & Dr. Eunice Mayah 90-110

6. CIRCULAR REAL ESTATE IN NIGERIA: CHALLENGES, PROSPECTS AND POLICIES

By Iruobe, P. O. & Ugwuejim, S. C. 111-137

7. NEMATODES AND SOIL HEALTH: A COMPLEX RELATIONSHIP

	By Kabiru Idris & Abdullahi Garba	138-155
8. ROLE OF FINANCE IN ACHIEVING NET-ZERO EMISSIONS IN NIGERIA		
	By Dumani A. Markjackson	156-176
9. POLICY AND REGULATORY FRAMEWORKS SUPPORTING GREEN FINANCE		
	By Dr. Taiwo IBITOMI & Dr. Betty Adejoke KOSILE	177-198
10. THE ROLE OF GREEN FINANCE IN ACHIEVING NET-ZERO EMISSIONS: AN ASSESSMENT OF POLICY INSTRUMENTS AND IMPACT METRICS		
	By Quadri Adebayo Lawal & John Adesina Adepoju	199-217
11. CONCEPT AND EVOLUTION OF GREEN FINANCE		
	By Kabiru, Muhammed Gaddafi	218-233
12. CLASSIFYING SUSTAINABILITY: THE ROLE OF LIBRARY AND INFORMATION SCIENCE IN ADVANCING GLOBAL STANDARDS AND TAXONOMIES		
	By Dr. Hussaini Musa & Abubakar Panti Abdullahi	234-252
13. GREEN FINANCE AND ENTREPRENEURSHIP IN CNG: SUSTAINABLE DEVELOPMENT GOALS APPROACH TO ADDRESSING POVERTY REDUCTION IN EMERGING ECONOMIES		

	By Ajao James Olatunji & Ahmed B. Rahmat	253-263
14. GREENWASHING AND TRANSPARENCY ISSUES IN GREEN FINANCE		
	By Mohammed Buhari Ibrahim	264-284
15. THE IMPACT OF GREEN FINANCE ON BUSINESS GROWTH AND EXPANSION IN NIGERIAN FINTECH COMPANIES. THE EMPIRICAL EXPERIENCE		
	By Ajiboye Walethomas & Otayokhe Esther Yemi ...	285-309
16. ENVIRONMENTAL DEGRADATION AS THE CASE FOR GREEN FINANCE AND AGRICULTURAL SUSTAINABILITY IN NIGERIA: HISTORICAL ROOTS, CONTEMPORARY CHALLENGES, AND POLICY PATHWAYS		
	By Sani Abdullahi Gusau	310-330
17. FINTECH, BLOCKCHAIN, AND DIGITAL GREEN FINANCE		
	By Dr. Tarila Boloupremo	331-355
18. ROLE OF GREEN FINANCE IN ACHIEVING SUSTAINABILITY: A CONCEPTUAL ANALYSIS		
	By Dr. Gbenga Festus BABARINDE	356-383
19. CLIMATE-SMART AGRICULTURE AND DRYLAND RESTORATION: A COMMUNITY-BASED CASE STUDY FROM REGION OF KATSINA STATE, NIGERIA		

By Rasheed Abiodun KURANGA, Bukola Baheedoh
MOSHOOD · Abubakar SAIDU 384-404

**20. IDENTIFICATION AND DESIGN OF A PLASTIC
BIOGAS DIGESTER FOR PRODUCTION OF
BIOGAS FROM AGRICULTURAL WASTE IN
BENUE STATE, NIGERIA**

By Gbeyongu Frederick Terkimbi and Shimave Aondohemba
Godwin 405-420

21. INTRODUCTION OF AUTHORS 421 -435

CHAPTER : 1

**FINTECH, BLOCKCHAIN AND DIGITAL
GREEN FINANCE IN PORT
MANAGEMENT: INSIGHTS FROM
NIGERIA**

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Abstract

This chapter examined the level at which financial technology (fintech), blockchain, or digital green finance can realign Nigerian port management in a way that would boost efficiencies, transparency, or sustainability. It starts by describing the major limitations that the sector is facing today—these being inefficiency, corruption, and environmental degradation. As it discusses the appropriateness of utilizing fintech to enhance payment settlements, trade finance reinforcement, and financial inclusion expansion in the Nigerian ports, the discussion then examines the possibilities of blockchain to enhance supply-chain governance, give real-time tracking of the cargo, and reduce fraud-induced accountability and security. The potential role that digital green finance could play is also mentioned in stimulating environmentally sustainable operations by funding green infrastructure and encouraging measures that cut carbon emissions. Based on literature review and available empirical works, and

Green Finance and Environmental Sustainability: Implications for Sustainable Development Goals

predominantly on African-oriented works, it establishes a critical assessment of the applications of the technologies as they relate to port management in Nigeria, referencing key success factors, anticipated issues, and policy actions that the stakeholders should consider in order to achieve materialization of economic harvests and sustainability fruits. Overall, fintech, blockchain, and other technology solutions can be seen as critical to the solution of long-standing problems in the work of Nigerian ports. The synergetic effect of their joint use is possible, which will help achieve resilience, efficiency, and environmentally friendly results in the industry. Consequently, the chapter accentuates the necessity of strategic policy making, sound regulatory policies, and inter-sectoral cooperation, which are the fulcrum of the successful implementation and maximization of such technological advances in the port system of Nigeria.

Keywords: Fintech, Blockchain, Digital Green Finance, Port Management, Nigeria.

Introduction

Nigeria, having its location on the Gulf of Guinea, possesses a massive portion of maritime resources, a vivid coastal coverage, and a strategic geographic location, which, all together, places the country in a good position to become a maritime hub (Ibrahim & Bello, 2021). The ports are the major access-to-exit points for commodities on which Nigeria's main economy is based. However, the use of this marine potential is limited due to inefficiency of operation, bureaucracy, widespread corruption and degradation of efforts at developing the port infrastructure. Simultaneously, the latest technological

Green Finance and Environmental Sustainability: Implications for Sustainable Development Goals

development, especially financial technology (Fintech), blockchain technology, and green digital financing, has been presented as an instrument that can change the global economy and society. The automation and redesign of the traditional functions of banks have brought considerable performance growth to local markets of Fintech, whereas blockchain, which is an inherently decentralised and unchangeable information carrier, promises an increase in transparency levels, reduce fraud, and a strictly-controlled supply-chain management.

At the same time, digital green finance promotes digital instruments with sustainable financing frameworks, thus positioning sustainability in the front line of development processes. It is therefore possible to envisage that sequential adaptation of these technologies provides the practical guideline in overcoming the deficiency in governance that currently paralyzes Nigerian ports.

On the port operations side, fintech will have the capability of simplifying financing regimes, expanding credit accessibility of port users, or accelerating the payment process by reducing corruption and expediting trade flows. The nature of blockchain as decentralized further boosts transparency, curbs malpractices, and enables detailed cargo tracking to improve the efficiency of operations. Digital green finance recognizes and incorporates environmental performance measures with the financing structure to provide port operators with the opportunity of cutting greenhouse-gas emissions and enhancing sustainable business operations. The evidence of these prospects is supported empirically: Akinmoladun, Okoye, and Tijani (2021) prove that fintech, though still at an initial

Green Finance and Environmental Sustainability: Implications for Sustainable Development Goals

implantation stage, has already enhanced system integrity and eliminated the efficiency deficiencies that existed in Nigeria. Similar research on blockchain-supported systems projects high data integrity and minimal friction in operations (Olawale, Alaba, & Adeola, 2021). The rise in policy interest in digital green finance is also evident as governments and international organizations are increasingly focusing on the climate-related developmental outcomes (Nnamani & Kalu, 2022). Taken together, such discourse raises the question of the potential advantages and associated entanglements of implementing Fintech, blockchain, and digital green finance in Nigerian port governance, thus providing an all-inclusive assessment of how such technologies can contribute to transparency in the port service, streamline operations, and improve environmental activities.

Fintech in Port Management

A review of the area of fintech in port management suggests that the use of technology-led financial services is swiftly transforming the industries across the globe. In this respect, fintech allows automating and optimizing port-related financial processes, thus providing the opportunities of enhancing the operational efficiency and increasing financial transparency. Traditionally, customs duties, port charges, freight payments, and trade finance operations involved thus far complicated, manual, and usually inaccurate operations in port logistics. These practices are time-consuming besides being prone to inefficiencies and corruption, hence delivering time losses and increasing the costs (Antwi-Boampong, Aidoo, & Adu, 2022). Research undertaken about the use of fintech in the

Green Finance and Environmental Sustainability: Implications for Sustainable Development Goals

ports of Ghana found a number of variables that determine the behavioral intention of port users to integrate digital financial solutions. Such variables are performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, price value, and habit. In spite of the fact that the research study was limited to the Ghanaian scene, the results of the study have a great potential to be applied to the Nigerian scenario due to its similar socio-economic problems and working territories of Sub-Saharan Africa. Automation of digital payment gateways and the use of online solutions to execute customs clearances and matters on payment of port charges could have a significant effect on reducing the period of processing and increase the effectiveness of collecting revenues (Oni, Ajiboye, & Olamide, 2020). Technological intervention would help them cope with limitations of the manual payment system, as they would be able to beat middlemen, lower costs of transactions, and speed up processing. In addition, Fintech is a booster to the widening access of trade finance, especially among small and medium-sized enterprises (SMEs) which are often side lined in maritime commerce. Through digital financial services, SMEs can access better credit options, thus, allowing them to engage in activities related to the ports to a greater extent and be more involved in the international trade system (Kanu, Chukwu, & Sulaimon, 2021). The process has the potential to promote more economic inclusion in the maritime environment in favor of local businesses and boosting the competitiveness of ports in Nigeria (Glover, Zaki, & Oliver, 2022). Therefore, the application of Fintech in the management of Nigerian ports is a powerful tool of modernisation and the elimination of inefficiencies and creation of inclusion in the

Green Finance and Environmental Sustainability: Implications for Sustainable Development Goals

economy in the maritime sector. Proper regulatory framework, and well-developed technological backbones, these innovations have the capability of bringing forth immeasurable efficiency as well as financial transparency to the ports.

Blockchain in Port Management

The use of distributed ledger technologies like blockchain based on a decentralized consensus mechanism is an unprecedented opportunity to make a contribution to the transparency in systems and an increase in efficiencies and security in the local, and therefore support the root of effective port operation- the supply chain management. The inherent qualities of the blockchain—the cryptographic integrity, immutability, and transparency—make it the means that is especially suitable to deal with the long-established logistical issues that plague port logistics. The technology can revolutionize the mechanisms through which goods flow, captured and transported through port environments, by making them secure and non-tamper able with record-keeping.

Among the uses it has identified, one of the loftier benefits of blockchain is greater visibility across the cargo supply chain. A mutable, collaborative, distributed record of all transactions and transportations makes possible real-time, end-to-end visibility of cargo origin to destination, thus eliminating the information silos common in legacy systems. The subsequent reduction in manual data entry, removal of processing delays, and incidence of errors all act to reduce the overall inefficiencies and prevent the chances of fraud and corruption (Olawale, Alaba, & Adeola, 2021). Idemudia (2024) presents the idea that, in a situation like Nigeria, where such

Green Finance and Environmental Sustainability: Implications for Sustainable Development Goals

malpractice has often hindered operations, these gains might end up revolutionizing the situation.

Specific application modes consist of smart bills of lading. Self-officiating digital contracts whose cargos can only be de-encoded when certain pre-established circumstances are met cut down on the velocity of traveling out, overcoming much of the tangled complexity and procrastination inherent in traditional paper-dependent systems. Simultaneously, blockchain can enhance the infrastructure of tracking shipment and provide all stakeholders with precise and timely information regarding the location and status of goods, speaking toward concerted movement between port officials, shipping companies, and customs organizations (Kanu, Chukwu, & Sulaimon, 2021).

Blockchain architecture built on distributed computing also helps enhance security and responsibility in port settings. Since no individual entity has power over the network, the ledger cannot be manipulated or tampered with, which makes it very resilient to cyber-attacks, cargo theft, illegal trade, and corruption, which have plagued many developing nations, including Nigeria, for decades (Glover, Zaki, & Oliver, 2022). Further, a malicious modification to this record becomes much more cumbersome due to the presence of a shared, transparent record.

Of equal importance is the role blockchain stands to play to automate documentation and digitize it. The technology reduces the time of customs processing by removing the need to use paper procedures, shrinking the minimum time required to process goods, and reducing the burden on ports, passing on an

Green Finance and Environmental Sustainability: Implications for Sustainable Development Goals

improved throughput and operational efficiency by eliminating one of the historic bottlenecks in port activities (Akinmoladun, Okoye, & Tijani, 2021). All in all, blockchain purports to make ports quicker, safer, and more transparent, thus facilitating the development of a more competitive and efficient maritime ecosystem.

Digital Green Finance in Port Management

Digital green finance allows ports to buy funds to finance green projects, such as the construction of shore power plants to reduce exhaust fumes emitted by the ships when docked, the acquisition of electric port vehicles or hybrid vehicles, and waste management and recycling projects. Digitalization plays a crucial role in this shift by connecting the creators of green projects and investors, issuing green bonds, and reporting the way invested resources affect the environment (Ogunbiyi, 2022). According to Almeida and Okon (2025), the support of digitalization programs in the African ports contributes to the development of the Sustainable Development Goals (SDGs), in particular SDG 8 (Decent Work and Economic Growth), SDG 9 (Industry, Innovation, and Infrastructure), and SDG 17 (Partnerships for the Goals). Their discussion highlights the fact that digital transformation will allow creating competitive ports and accomplishing both environmental and social commitments at the same time (Nwachukwu & Eze, 2024).

At the same time, digital technologies enable real-time calculation and control of environmental parameters at the ports, including air quality, the quality of water, and energy consumption, thus providing port authorities with practical

Green Finance and Environmental Sustainability: Implications for Sustainable Development Goals

information. Based on given results, one is able to take specific actions and show environmental stewardship using this type of data-driven strategy. The essential success factors of green port transformation through digital technologies are mentioned by Su, Lee, and Wang (2024): the coordination of digital tools with port infrastructure, the optimization of digital management and operations, and shoring up environmental and safety practices. Their studies are devoted to the Korean maritime industry, but their discoveries provide knowledge that can be used in Nigerian ports because the problems that they faced are similar (Oni & Ajiboye, 2023).

The tools based on the platform also help the ports improve the environmental management due to real-time uploads and evaluation of the compliance with the environmental requirements (Raza, 2021). These enhancements support the initiatives of the reduction of emissions, optimization of resources, and waste management (Almeida & Okon, 2025). Blockchain technology to deliver transparent data on the environment also promotes verifiable sustainability initiatives, where the stakeholder interests can be sure, and the population can trust (Olawale, Alaba, & Adeola, 2022).

Intersections and Synergies

Fintech, blockchain, and digital green finance have synergetic influences that make up a revolutionary system to achieve sustainable development of port systems. The intersection of all these technologies creates an end-to-end ecosystem with the potential to trigger sustainable management of ports. Incidentally, blockchain provides a safe and transparent platform upon which green-finance transactions

Green Finance and Environmental Sustainability: Implications for Sustainable Development Goals

can occur that allow the effectiveness of how funds are being allocated to be verified, as well as the quantification of impact (Almeida & Okon, 2025; Ogunbiyi, 2022). Fintech, in its turn, promotes micro-financing practices to offer sustainable financing opportunities to the largest number of port stakeholders, including small and medium-sized enterprises (SMEs) (Su, Lee, & Wang, 2024). To use the example of a port that tries to reduce its carbon emissions by investing in renewable energy projects, e.g., wind or solar energy. Fintech platforms may enable digital green-finance instruments that are needed to attract the necessary capital through the use of blockchain in tracking the channels used to disperse such funds and allowing real-time monitoring of both energy usage and emission reduction.

The data produced do not only improve the transparency and financial efficiency but also improve the accountability of achieving sustainability goals. Due to the availability of verifiable records with blockchain, investors and regulators can trust the system, thus avoiding risks that could cause fraud or mismanagement (Kanu, Chukwu, & Sulaimon, 2021). The convergence of such technologies in some places can then develop strong, sustainable mechanisms of port development that have been hampered by corruption and a lack of transparency in many places in Nigeria. Fintech overcomes such financial constraints in terms of providing affordable and accessible financing systems, blockchain introduces trust in terms of transparent and tamper-proof records, and the green finance based on digital technology channels funds on more environmentally friendly activities (Glover, Zaki, & Oliver, 2022). This kind of integration will allow the Nigerian ports to

Green Finance and Environmental Sustainability: Implications for Sustainable Development Goals

bypass the traditional bottlenecks and accelerate their movement towards a more efficient and sustainable way of operation (Ibrahim, 2023). Key to the effective application of this coordinated solution is an effective regulatory environment, the investment in the necessary digital infrastructure as well as concerted effort by government, port operation agencies, the private firms and the financial institutions (Oni & Ajiboye, 2023). The combination of Fintech, Blockchain, and Digital Green Finance distinctive abilities allows taking systematic inefficiencies at Nigerian ports, thereby enabling them to become global port management role models.

In this chapter, the researcher examines the meaning of fintech or blockchain and digital green finance on port management in Nigeria through qualitative literature synthesis. Using the secondary data method, the literature consisting of primary sources was identified using Web of Science, Scopus, and speculative journals in order to identify the current landscape, the major issues, the future benefits, and the success factors. Policy statements, scholarly articles, sectoral reports, and case studies outside Nigeria (ports) were retrieved in documents, which were consulted in order to enable the identification of the transferable insights. The material collected was then analysed through the procedure of thematic analysis to reveal the most common trends and to extract the implications of these technologies on the traffic of the port. In this approach, the paper demystifies the strategic motivation, blockages, and opportunities that come as a result of fintech, blockchain, and digital green finance integration in the Nigerian ports.

Conclusion and Recommendations

In determining the aggregate transformative capacity of fintech, blockchain, and Digital Green Finance on transforming port management in Nigeria, the chapter analyses the following three dimensions. It shows how the converging technologies can solve these historic impediments, namely inefficiency, weak transparency, systemic corruption and environmental unsustainability, at the same time and irreversibly limit the constraints to the port sector that have so long been plaguing Nigeria. Collectively, Fintech increases the speed of financial operations, reduces the threat of corruption, and enhances access to trade finance; Blockchain provides a resistant-to-manipulation, transparent record of activities and mechanizes documentations, and enhances cybersecurity; Digital Green Finance refocuses financing of environmentally sound infrastructure, hence, reducing the carbon-footprint of port operations. All these are innovative developments that to a great extent culminate to provide a holistic roadmap to operational efficiency, transparency and ecological stewardship and promises to open up the entire economic potential of the Nigeria ports as locomotives to national development and regional trade. This chapter recommend the following suggestions to policymakers, port authorities, other members of the private sector, and other stakeholders involved:

The government of Nigeria should develop an overall plan of digitalising the port operations, including of Fintech, Blockchain, and Digital Green Finance with specific goals, schedules, and key performance indicators in collaboration with the port officials and players in the industry.

Green Finance and Environmental Sustainability: Implications for Sustainable Development Goals

Environment. Regulatory agencies (mostly Central Bank of Nigeria and the Nigerian Ports Authority) should develop proactive policies that will support the use of technology without jeopardizing consumer protection, confidentiality of data and stability of the financial system. Heavy investment is needed to improve and strengthen digital infrastructure at the Nigerian ports such as, enhanced internet connections, enhanced cloud computing and improved cybersecurity, to facilitate smooth operation of Fintech and Blockchain platforms.

A skilled workforce is requisite in the achievement of technology implementation. Work with universities and technology companies should be done to develop training programs of port personnel, customs officials, financial service providers, and other stakeholders.

Foster Public-Private Partnerships and Collaboration. The successful process of these technologies requires organisational synergy between the state institutions, businesses operating in the trenches, the vessel companies, the logistics, monetary and the comparative sources.

The government must provide tax benefits, subsidies and preferential policies to encourage the involvement of the private sector in embracing environmentally friendly technologies.

Highly effective data governance frameworks and interoperability standards are essential to the delivery of maximum returns by the innovations due to secure and effective exchange of data between different platforms and systems.

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CHAPTER : 2

CIRCULAR ECONOMY AND SUSTAINABILITY RESOURCES MANAGEMENT

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Abstract

This study critically examines the interrelationship between the Circular Economy (CE) and Sustainable Resource Management (SRM) in the 21st century, emphasising their combined potential to transform global production and consumption systems. It explores the foundational principles of CE recycling, reuse, remanufacturing, and eco-design as sustainable alternatives to the traditional linear economic model of "take-make-dispose." The paper traces the evolution of resource management, from early conservation practices to the adoption of advanced, system-based sustainability frameworks in modern economies. It argues that CE and SRM are mutually reinforcing paradigms: while CE focuses on maintaining material value and minimising waste, SRM ensures the efficient, equitable use of natural resources for present and future generations. Drawing on key international initiatives such as the European Union's Circular Economy Action Plan, China's circular development policies, and the African Circular Economy Alliance, the study highlights global efforts toward achieving circularity and resource sustainability. Despite these advances, challenges such