

**A LITERATURE REVIEW ON CAPACITY DEVELOPMENT FOR A CLIMATE –
RESILIENT INDUSTRIAL LABOUR FORCE IN NIGERIA: THE ROLE OF
DEVELOPMENT FINANCE INSTITUTIONS**

¹Abdullahi Usman, ²Abdulrasheed Abdulganiyu

¹Department of Economics, Faculty of Social Sciences, University of Maiduguri, Borno State,
Nigeria

²No. 2 Limpopo Street, Maitama Abuja, Nigeria

Abstract

The global move to adopt alternative energy source to mitigate excessive effects of the global warming among countries especially in the less developed countries created an opportunity to invest in the development of a labour force that are climate responsive. Development Finance Institutions (DFIs) play an important role in providing substantial support in developing these skills that are purely green in nature. This study examines how DFIs provided initiatives and support programmes targeting the industries particularly that utilise climate responsive labour force in Nigeria. The study utilizes the existing research on the topic, DFIs' role in supporting climate change adaptation, the challenges and opportunities associated with building a climate friendly labour force in Nigeria. The result of this findings highlight the important roles played by DFIs in providing financial and technical assistance for green skill development, promoting sustainable green industrial practices in Nigeria and creating an opportunity for diversification to enhance sustainable development in the country. The study further identifies critical areas for DFIs to focus on, including vocational training, financial incentives, partnerships, monitoring and evaluation among others. It also shade lights on the need for a coordinated approach involving government, industries, private organizations and civil society groups to support the development of capacity in green skill jobs. The study outlined recommendations for DFIs, policy maker, and industry stakeholders to encourage the development of capacity in green skills and promote a climate friendly industrial sector in Nigeria.

JEL Classification: G28, H23, Q42, Q54.

Keywords: Capacity Building, Development Finance Institutions, Green Skills.

Introduction

The countries around the world are increasingly recognizing the importance of a shift to a low-carbon society to mitigate the effects of climate change. The Paris Agreement, adopted in 2015, aims to limit global warming to below 2° C and pursue efforts to limit it to 1.5° C, National Oceanic Atmospheric Administration (NOAA, 2022). To effectively achieve this goal, countries are required to adopt climate responsive policies and practices to key into this initiatives by developing the labour force specialized in green skills. In Nigeria, the federal government has launched several initiatives aimed at promoting sustainable development and reducing greenhouse emissions. The country has developed a

National Action Plan on climate change, which outlines strategies for mitigating and adapting the effects of climate change on the economy. The development of green skills is crucial to supporting the shift to a low-carbon economy. Green skills refers to the Knowledge, skills, activities, and attitudes required to work effectively in a sustainable and environmentally friendly manner.

In Nigeria, climate change activities have gain momentum in the recent years, with the government launching many initiatives and programmes to reduce greenhouse gas emissions and to promote sustainable development (Nwankpa, 2022). One of these initiatives is developing climate resilient labour force for sector primarily driven sustainable development in the

country. However, successful implementation of these initiatives and plans requires financial and technical support to develop a labour force with the necessary skills and competencies to fully engage and drive these activities. Development Finance Institutions (DFIs) are playing a significant role to that effect in providing support for labour force development using different strategies in Nigeria to enhance knowledge acquisitions in green skill development. The African Development Bank (AFDB) has illustrated such efforts through establishment of a number of programs to support such initiatives including the African Development Fund (ADF), and the Nigerian Trust Fund (NTF), (AFDB, 2023). The World Bank Group is another partner which has provided substantial support for green skill development for labour force in Nigeria through its country partnership framework (CPF) (World Bank 2022).

Though, there are many researches on development of climate resilient labour force and green skills such as Pearce, *et al* (2022), Odhiambo, *et al* (2022), Baffour, *et al* (2023), and Meattle, *et al* (2024). There is a paucity of research on the role of DFIs in supporting green development programmes in Nigeria. This study aims to focus on this gap by exploring the role of DFIs in supporting green skill development programmes in Nigeria. Despite the significance of developing labour force strategies in addressing the challenges posed by climate change globally, specifically, this study examined the labour force development strategies employed by DFIs in Nigeria, the strategies provided by the DFIs to support green skill development programmes, and monitoring and evaluation frameworks established by DFIs to access challenges and opportunities associated with developing capacity in green skills acquisition. How do Development Finance Institutions (DFIs) contribute to capacity for a climate resilient industrial workforce in Nigeria?

Literature Review

Conceptual Issues

Climate change refers to a “change of climate is attributed directly or indirectly to human activities that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time period” Intergovernmental Panel on Climate Change (IPCC, 2021). Climate change was defined by (NOAA, 2022) as “the long-term warming of the planet, which is primarily caused by the increasing levels of greenhouse gases in the earth’s atmosphere, mainly due to human activities such as burning fossil fuels, deforestation, and land use change”. United Kingdom Investment and Finance, (UKNAIF, 2024) defined climate finance as any financing for credible climate action. This includes activities such as renewable energy projects, energy efficiency, reforestation efforts, climate friendly infrastructure development, and mitigating or adapting to climate change. The goal of climate finance is to mobilize resources for support activities that contribute to green growth or climate resilient development United Kingdom Nigeria Investment and Finance (UKNAIF, 2024), (IPCC, 2021).

Empirical Review

In a study conducted by Baffour *et al*, (2023) on Building the Resilience of Smallholder Farmers to Climate Variability: Using Climate-Smart Agriculture (CSA) in Bono East Region, Ghana. The study examined how smallholder farmers are building their resilience to climate variability using a climate smart agriculture practices in the study area. The study focused on trends of temperature and rainfall for the period of 2011-2021. The study identified and ranked CSA practices adopted by respondents for resilience building in agricultural system. It also enumerated barriers confronting successful operation of CSA in the study.

Data were collected from both household survey and key informant interview on the experiences on CSA practices and challenges faced during implementation.

The CSA practices and barriers were ranked and analyzed using the Relative Importance Index (RII), and Weighted Average Index (WAI). The result showed that rainfall was inconsistent and temperature rose from 2011-2021, in the study area. Result further indicated that CSA practices implemented by smallholder farmers in the Bono region, were appropriate: Fertilizer Application (RII=0.758), and Crop Diversification (RII=.0717).

The result further identified Disease and Pests (WAI=1.173), and Crop Diversification (WAI=1.0677). The study concluded that smallholder farmers in Bono region and Ghana at large can build resilience to climate change variability by adopting effective implementation of Climate Smart-Agriculture CSA practices. Several Development Finance Institutions (DFIS) are currently providing support for the green skill development for labour force in Nigeria. They include the African Development Bank (AFDB), the World Bank, and the European Investment Bank (EIB), (AFDB, 2022). (EIB, 2022), (World Bank, 2022). These DFIs also provided financial incentives, such as grants, and loans, to support equipping labour force with requisite skills to respond to climate change in Nigeria.

In a study conducted by the (AFDB, 2023) it was discovered that financial incentives can help encourage businesses to invest in green skill development in less developed countries Nigeria inclusive. In a similar study OECD, (2024) in report on infrastructure for a climate resilience identified financial flows for climate resilience on infrastructure are limited relative to the high demand for it to address the growing impacts of climate change in less developing countries. The report further provided an economic argument for investing in climate resilient infrastructure. It also reported that, weakness in the environment and lack of risk awareness are preventing consideration of benefit of increased climate resilient in public and private investment. The report also

highlighted the need for mobilizing private financing and investment which was identified as critical for achieving resilient infrastructure system. The report recommended concrete efforts to address barriers, ensuring effective risk sharing and in some cases strategic use of public support will be critical for unlocking this untapped potentials. The report pointed out that, there is a growing pressure on funding resources for the existing infrastructure, there is an important role for developing new funding models, including land value capture.

Nwankpa, (2022), in an article Managing Existential Risk and Climate Resilience: The Case Study of Nigeria, focused on impact of climate change in Nigerian Socio-economic systems which manifested in form of extreme weather patterns, and desertification were among challenges affecting means of livelihood among local communities. The challenges impacted so much on food security in the country. Other challenges identified by the study was insecurity which disrupted food supply and consequently increased prices of goods and services consumed in the community. The paper observed that, Nigeria has 2.6% of the world population and it is responsible for 0.26% of the global emission. This was supported by the work of (Baffour *et al*, 2023), (Zhong & Wang, (2021), 2021), and (Khan *et al*, 2022). The paper recommended a collective effort must be initiated and pursued now to take active and effective action against climate change.

Climate change has become a major issue attracting attention at global level, with the first international conference on climate change held in 1979 since then, many international conferences and agreements, including the Kyoto Protocol and Paris Agreement, have been signed to mitigate the effects of climate change United Nations Framework Convention on Climate Change (UNFCCC, 2023). Strategies targeting labour force are critical in addressing the challenges posed by climate change. According to the International Labour Organization (ILO.2019), workforce

development strategies can significantly help equip workers with the required skills to adapt to a changing climate. A World Bank (2022) reported that workforce development strategies can help reduce greenhouse gas emissions and promote sustainable development.

Meattle *et al*, (2024) in an article title Landscape of Climate Finance in Africa. The paper explored Opportunities and Challenges associated with climate activities in the African region. The study focused on the experiences of Sub-regions in Africa where some are enduring severe multi-year drought, others experienced extreme rainfall and flood, with significant consequences that undermined livelihood and hindered the realization of Sustainable Development Goals (SDG). More so, it was observed that African Continent is grappling with rising debt levels, high food and energy prices with compounding cost of living crises on the welfare of the citizens.

However, the study noted that, despite these, Africa is projected to have ranked eleventh of the world's 20th fastest growing region economies in 2024 making it the second fastest growing region after Asia. The study further stated that in the last few years, Africa witnessed transformative climate initiatives in the area of African Carbon Market Initiative, African Green Hydrogen Alliance, and the African Climate Risk Insurance Facility for Adaptation.

Consequently, the study recommended for an urgent need for more solutions that can unlock its numerous potentials for climate finance, action and sustainable development for Africa. In addition, the paper pointed out that, addressing development and climate priorities require a clear understanding of the size of investment gaps, where they exist and how to effectively bridge the gaps identified.

Methodology

This article used a desk research method, systematically reviewed literature on the existing studies on labour force development strategies employed by DFIs targeting green skills, in Nigeria. The roles

of Development Finance Institution in supporting sustainable development were also reviewed. More so, a content analysis of DFI's reports, policy document and project evaluation using secondary data sources. These data were obtained from African Development Bank (AFDB), United Kingdom Nigeria Infrastructure Advisory Facility (UKNIAF), World Bank, Central Bank of Nigeria (CBN), National Bureau of Statistics (NBS,) Journals, relevant textbooks, and other online resources. In addition, the study employed a deductive method to systematically analyze the data where conclusion were effectively drawn.

Opportunities, Challenges and Role of DFIs in supporting climate change adaptation, focusing on development of man power in Nigeria.

Opportunities Nigeria stands to gain from climate change activities to support labour force in the green economy:

1. Increased Investment and Economic Growth

Climate change activities can attract new investments to the Nigerian economy particularly, international organizations and private sector companies. According to the African Development Bank, the green economy can attract up to one trillion dollars in investments in Africa by 2030, (AFDB 2023).

2. Job Creation and Employment Opportunities

Investment in climate change activities can create new job opportunities in Nigeria, reducing youth unemployment, particularly in renewable energy sector, smart-Agriculture, and eco-tourism. According to the International Labour Organization (ILO, 2019), the green economy can create up to twenty four million new job globally by 2030.

3. Development of New Industries and Sectors

Climate change activities can lead to the development of new industries and sectors in Nigeria, such as production and distribution of solar panels, wind turbines, and green building materials (George *et al*,

2022), (Singh *et al* 2022). This can effectively facilitate the diversification effort in Nigeria to reduce dependence on oil.

4. Enhanced Skill Development and Capacity Building

The activities of the climate change in Nigeria can enhance transfer of knowledge, develop skill acquisition and capacity building among the youth, particularly in the areas of renewable energy, climate resilience and smart Agriculture and was in line with (Baffour *et al*, 2023). This can significantly help in building more skilled and adaptable labour, to effectively respond to the challenges and opportunities associated with green economy in the society.

5. Improved Energy Access and Security

Investment in Climate Change activities can improve energy access and security in both rural and urban centers in Nigeria, particularly through the development of renewable energy sources such as solar, wind and hydro power. This can significantly reduce the country's dependence on fossil fuels and improve energy access for rural areas and enhance the contribution to the Gross Domestic Product (GDP) (Odhiambo *et al*, 2022)

Challenges Associated with Climate Change Activities in Nigeria

1. Rising Temperature and Extreme Weather Events

Nigeria as country is already experiencing rising temperature across the country, with an increase of 1.3⁰ in the past century. This is leading to more frequent and intense extreme weather events such as droughts. Floods, and heatwaves, which are having devastating and significant impacts on Agricultural produce, Infrastructure, and Human health (NOAA, 2022), (Nwankpa, 2022).

2. Increased Risk of Water Scarcity and high level of conflict

Nigeria is currently experiencing increased water scarcity, with climate change projected to reduce water availability by up to 20% by 2050 (IPCC, 2021). This

increasing competition for water, leading to conflict between communities, farmers, and herders (IPCC, 2021), (Nwankpa, 2022) has significantly affected productivity in many sectors driving the Nigerian economy.

3. Devastating Impact on Agriculture and Food Security

Climate activities is having a significant impact on Nigeria's agricultural sector, through variation in rainfall patterns, increased temperature, and more frequent extreme weather events leading to crop failures, and reduced yields, and decreased food security leading to high food prices in the country, International Fund for Agricultural Development, (IFAD, 2023), (Pearce *et al* 2022), (Huo, *et al* 2022) and (Nwankpa, 2022). This is exacerbating poverty and hunger, particularly in rural areas.

4. Economic Impacts and Loss of Means of Livelihoods

Climate change is having significant economic impacts in Nigeria, with estimated losses of up to 11% of Gross Domestic Product (GDP) by 2025 (FAO, 2023 & Huo, *et al* 2022). The country's economy is heavily reliant on agriculture and natural resources, which are vulnerable to climate related shocks leading to loss of means of livelihoods, particularly for the smallholder farmers and pastoralist communities across the country.

5. Growing Health Risk from Climate-Related Diseases

Climate change activities is increasing the risk of the spread of climate-related diseases such as cholera, heat stress, and malaria in Nigeria. The country's healthcare system is already overstretched, and additional burden of climate related diseases is exacerbating poverty, hunger, morality rate and inequality.

Role of DFIS'

DFIS' Role in Supporting Climate Change Adaptation focusing on Labour Force Development Need in Nigeria: Development finance institution engaged in supporting the development of green skill programs in the following areas:

1. Technical Support

Development finance institutions provided technical support for the development of green skill programs in Nigeria through Technological transfer to enhance green skill practices in the country. World Bank for instance, has engaged in partnership with the Nigerian government to establish the Climate Technology Program (CIP), to support the transfer of climate resilient technologies into the Nigerian economy, for easy access to local industries investing in capacity building for green skills in Nigeria (World Bank, 2022) (Khan *et al*, 2022).

More so, in a study by (Zhou *et al*, 2021) Building Capacity for Green Growth in developing Countries, it was documented that, Development Finance Institutions provided capacity building and training programs to support green skill development in Nigeria. In another development, The African Development Bank for instance has established the African Development Fund to provide technical assistance and capacity building programs for the enhancement of green skill practices in Nigeria (AFDB, 2023).

2. Apprenticeship and Mentorship

Development Finance Institutions offer apprenticeship and mentorship training opportunities for young professionals to gain hands-on experience in climate responsive industries in Nigeria (IFC, 2020), (Singh *et al*, 2022). These are undertaken, through the on-the-job training development for green skill practices in Nigeria. The International Finance Corporation for example, has established the African Youth Empowerment Initiative, which effectively provided on-the-job training and apprenticeships for young people in the country's renewable energy sector with beneficiaries from the areas of:

a. Vocational Training: DFIs supported vocational training programs to investments that focus on climate change activities, such as production of solar panels, solar panel installation, maintenance of solar Batteries,

sustainable water management and wind power development.

b. Upskilling and Reskilling: DFIs provide training programs for the existing labour force on refresher courses in order to update their knowledge in green skill practices in Nigeria. These training covers green construction, renewable energy source, and sustainable agricultural practices. In line with this development, Pearce *et al*, (2022), reported that DFIs provided mentorship support to entrepreneurs in Nigeria's green economy through mentorship programs. In addition, African Development Bank has established the entrepreneurship innovation lab, which provides mentorship and training to Nigerian entrepreneurs that are engaged in renewable energy sector of the Nigerian economy. DFIs also work in partnership with Nigerian government to provide industry-led training and mentorship in green skill for worker. European Investment Bank has worked in collaboration with the government of Nigeria to established the Nigeria Climate Change Response Program (NCCRP), which provides industry-led training and mentorship for young people investing in Nigeria's green economy (EIB, 2022), (Khan *et al*, 2022) these target the following areas:

c. Industrial Analysis: To effectively conduct an analysis of climate responsive industries, identifying areas of growth and job creation potentials where the result of the analysis is going to be accessible and effectively utilized by stakeholder as a low cost, Singh, *et al*, (2022).

d. Job Marketing Forecasting: UNCTAD, (2023) observed in her report that, the DFIs provided opportunity for the beneficiary countries to forecast job market demand for climate-relevant skills and industries in these countries.

e. Skill Gap Analysis: OECD, (2024), & IFAD, (2023) reported that DFIs identify skill gaps in the existing workforce and develop strategies to address these gaps by giving them appropriate support to the developing nations across the world Nigeria inclusive.

3. Partnerships and Collaborations

This is another area Nigeria is working with DFIs to facilitate capacity building in green skills which focus on these areas. DFIs established partnerships and collaboration with local stakeholders to support development of labour force specialized in green skill in Nigeria. The European Investment Bank, for example has effectively partnered with the Nigerian government to establish the Nigeria Climate Response Program (NCCRP), which provides technical support for green skill development targeting local industries in Nigeria (Odhiambo *et al* 2022). This effort provided government agencies, ministries, and departments to align labour force development initiatives with national climate change strategies and policies.

a. **Academic and Knowledge Sharing Partnerships:** Kahn *et al*, (2022) reported that, DFIs facilitate knowledge sharing programs to support green skill development in Nigeria, through funding of grants to Universities, Research Institutions, and Vocational Training Centers to develop and deliver climate-relevant training programs.

b. **Industrial Partnerships:** This is another important area where the DFIs effectively collaborate with private sector companies, industries associations, non-government organizations, and chamber of commerce to identify critical labour force development needs and opportunities in Nigeria, UNCTAD, (2023),.

c. **Financing and Incentives:** Singh, *et al*, (2022) observed that, financing and incentives another window opportunity where DFIs significantly provided

resources both on short, medium, and long-term finance to develop capacity development in green skills in Nigeria and these focus on the following areas:

i. **Tax Incentives:** DFIs advocate for tax incentive and subsidies targeting businesses and individuals investing in climate relevant skills and industries. This effort encourage investor in bursting their productivity and profitability (World Bank, 2022).

ii. **Loan Financing:** They also offer loan financing for businesses and individuals that invest in climate responsive skills and industries and this has significantly enhance their capacity to diversify in their operation (EIB, 2022).

iii. **Grant and Funding:** According to World Bank (2022), AFDB, (2023) & EIB (2022) DFIs has been providing grant funding for labour force development initiatives, in the areas of training, skill acquisition, apprenticeship, and vocational training. This grants and funding will significantly improve the performance of these sectors in the area of research and development which give room for innovation in green job in the country.

Monitoring and Evaluation

This covers the following areas:

a. **Yardstick for performance:** DFIs establish a robust performance yardstick to track effectiveness of labour force development initiatives in the country to adequately monitor, supervise and evaluate the performance of the sector using a world best practice.

b. **Feedback Mechanisms:** DFIs in respond the developmental challenges in the less developed countries establish feedback mechanisms to gather responses from stakeholders, including trainees, employers, and industry experts to assist in addressing challenges identified.

c. Impact Assessment: DFIs conduct regular impact assessments to evaluate the impacts of labour force development initiatives on the climate-responsive industry in these countries Nigeria inclusive.

Factors affecting climate change in Nigeria, and these can be categorized in Natural and Human factors

Natural Factors: These are factors that are not influence by human behaviours and man has nothing to do in order to stop but only to cushion their effect if they occurred on the environment.

1. **Temperature:** Rising global temperatures are leading to increased temperatures in Africa and Nigeria in particular these has a severe consequence on the environment leading to excessive flood and in some areas drought are experienced (IPCC, 2021).

2. **Rainfall Patterns:** Changes in the rainfall patterns are affecting agriculture and water availability and management in Nigeria has significantly influence productivity especially on agricultural produce and other human activities causing heavy damages to both lives and properties in the country (IFAD, 2023).

3. **Sea-Level Rise:** Rising sea levels are threatening coastal communities and ecosystems in Nigeria this lead to excessive flooding in the riverine and coastal areas causing displacement of coastal communities and their means of livelihoods (IPCC, 2021).

Human Factors: This are factors created by human activities that directly or indirectly influence climate change in the Nigerian economy. These include:

1. **Deforestation:** Widespread deforestation in Nigeria in form of excessive cutting down of and burning of trees for processing charcoal for cooking or clearing of bush for farming activities, and construction of road, are significantly contributing to climate change by releasing stored carbon into

the atmosphere there by affecting productivity in the economy (Huo, *et al* 2022 & FAO.2022).

2. **Agricultural Practices:** Inefficient agricultural practices such as bush burning, use of toxic chemicals like herbicides and insecticides on farms and farm produce and also using synthetic fertilizers over the years in Nigeria have significantly added to the release of greenhouse gases into the atmosphere in the country, affecting the environment, (IFAD, 2023) & (FAO.2022).

3. **Industrial Activities:** Though the level of industrial activities in Nigeria and Africa in general was not as high as in their counterpart in the other part of the developed world especially Asia, Europe and America. Industries operating in Nigeria such as cement production companies, oil refining companies, and transportation companies are contributing significantly to the greenhouse emission in the country (NBS, 2023).

4. **Waste Water:** Poor water management practices particularly oil spillage, waste water released from industries, and sewages are significantly leading to the emissions of methane from landfills which ultimately affect the environment (Chipalkatti, Le, & Rishi, 2021).

5. **Fossil Fuel Consumption:** Nigeria's heavy reliance on fossil fuels for energy has contributed significantly to climate change through greenhouse gas emission (Bodansky, 2010). These has affected economic activities and endanger live on both environment and aquatic habitat.

Conclusion and Recommendations

Conclusion

This study examined developing a climate-Resilient labour Force: A Literature Review on Capacity Development for a Climate – Resilient Industrial labour force in Nigeria: The Role of Development Finance Institutions. It highlights the importance of

labour force development strategies in addressing the challenges posed by climate change. Development Financial Institutions such as African Development Bank, World Bank, and the European Investment Bank are playing significant role in supporting green skill development programmes in Nigeria through incentives, collaborations and partnerships.

This article also identifies the need for standardized evaluation frameworks to assess the effectiveness of green skill development programs in the country for an improved productivity across all sectors of the economy. The study further contribute to the existing body of knowledge on the role of the DFIs in supporting mitigation activities toward development of green skill in Nigeria. It also provide a further research on this critical and emerging topic and it highlight the need for continued support for green skill development in the Nigerian economy.

Recommendations

This study recommended that Nigerian government to create a conducive business environment for foreign direct investment into the country, focusing on the development of labour force that specialized in green skill activities across all sectors of the Nigerian economy. The study also recommends that Development Financial Institutions (DFIs) should strengthen partnerships with government agencies in Nigeria, private sectors, and civil society organizations to support green skill developments in Nigeria.

There is also the strong need for the DFIs to increase their financial support through provision of interest free loans, and other incentives such as grants to support green skill development at the grass root in all sectors of the Nigerian economy. Development Financial Institutions should intensify efforts to support labour force development strategies that promote green skills, such as training and capacity building programs. It also recommended that Development Financial Institutions to assist developing nations with accessible and

affordable finances for them to harness effective green skill development programmes in their countries.

The article further recommends that both the government and the Development Financial Institutions should work in partnership to promote private sector engagement in green skill empowerment in Nigeria, through initiatives as public-private partnerships. The Nigerian government should also develop policies that support the green skill development such as tax incentives, and subsidies for businesses that actively invest in green skill development programmes.

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