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IMPACT OF CLIMATE FINANCING ON CLIMATE CHANGE MITIGATION: EXAMINING THE NEXUS BETWEEN GREEN ENTREPRENEURSHIP, CLIMATE ADAPTATION, CLIMATE MITIGATION AND JOB CREATION IN KADUNA METROPOLIS

[1] Joshua, Yabanat Benjamin; [2] Elisha, Yari Dangiwa; [3]John, Isaac; [4]Oladipo, Abimbola Oluwaseun

[1 &4]Department of Economics, Nnamdi Azikiwe University Awka, Anambra State
[2]Department of Economics, Kaduna State University, Kaduna
[3]Department of Political Science, Federal University Wukari, Taraba State

Corresponding Author: benjaminyabanat.byj@gmail.com

ABSTRACT

Climate change is one of the major problems that hamper the economic growth of many countries in the world due to its severity on environment and destructive tendencies. This makes the scenario become a thing of concern to the entire globe. As a result, this study analyses the impact of climate change financing on the mitigation of climate change and how climate change financing promotes adaptation of green entrepreneurship, reduces unemployment and promotes job creation in Kaduna metropolis. The study used multi-stage survey method as strategies for data collection, such as questionnaire and key informant interview. Furthermore, binary respond model was used for data analysis. Results from the findings reveal that climate change financing (CCF) has not been able to reduce climate change in Kaduna metropolis, due to lack of accessibility to climate change financing by stakeholder of green entrepreneurship. It further shows that households who adapt green entrepreneurship are less likely to access loans from financial institutions, and those who adapt green entrepreneurship are more likely to be gainfully employed. Lack of enough awareness or information, training and workshops on new technology reduces opportunities for green entrepreneurship adaptation. The study recommends among others, that there is the need to encourage households in Kaduna metropolis to adapt green entrepreneurship. Loans should be provided to households at low interest rate and without collateral to encourage households adapt green entrepreneurship.

Keywords: *Climate change, Climate Financing, Mitigating, Green Entrepreneurship, Adaptation, and Job Creation*

JEL Classification Codes: *Q54, Q56, Q58, O15, J23*

1.0 Introduction

Climate change has been a topical issue in the global economy due to its negative impact on sustainable development in both developed and developing economies (Intergovernmental Panel on Climate Change [IPCC], 2023; United Nations, 2023). Most countries of the world are suffering from

climate change due to anthropological activities and other natural disasters (IPCC, 2023). This situation results to ecological imbalances, causing drought, diseases, mutations (man, animal and plants), food insecurity, scarcity of raw materials, unemployment and loss of jobs; which culminates to high unemployment, and other social vices such as armed robbery, prostitution, kidnapping, to mention but a few (Adelekan et al., 2022; Food and Agricultural Organisation [FAO], 2023; World Bank, 2022). The situation further requires climate change actions that would mitigate climate change and encourages adaptation of green entrepreneurship that guarantees stable economic growth, job creation and sustainable development that would improve the wellbeing of households (United Nations Development Programme [UNDP], 2022). Given these growing socio-economic, and environmental challenges, climate finance is among the major global strategies that have been developed to help achieve mitigation and adaptation goals, especially in the developing nations most at risk from climate change (IPCC).

Climate change finance refers to as funding at the local, national or transnational level that supports the actions needed to combat climate change. It affects everything from national policy to the ground-level changes that make concrete differences in peoples' lives. These funds may be drawn from public, private or alternative sources (International Fund for Agricultural Development [IFAD], 2022). Climate finance is needed both to mitigate emissions and to help communities and economies adapt to the changes that are now inevitable. If greenhouse gas emissions are not reduced immediately, it will not be possible to limit warming to 1.5°C, or even 2°C, putting the world on a catastrophic path. Meanwhile, climate change has already affected people, nature and infrastructure (IPCC, 2023; Nwankwo & Okeke, 2023).

In order to enhance climate change activities, various policies have been put in place by governments and development partners in an effort to unlock climate finance and encourage green economic practices. Some of the policies in Nigeria include the National Climate Change Policy (2021-2030), the Climate Change Act (2021), the Nationally Determined Contributions (NDCs), and the Energy Transition Plan which are all intended to foster climate resilient, green investments, and livelihoods through unlocking climate finance (Federal Government of Nigeria, 2021; National Council on Climate Change, 2022). However, there is still a challenge of accessing climate finance for many households and small-scale green businesses.

Financial institutions, private, public NGOs are considered shock observers with high

propensity to providing climates change finances than any other institution informs of loans and grants to support unemployed youth towards engaging in adaptation of green entrepreneurship that would create employment opportunities, mitigates climate change and incomes to improve the economic wellbeing of households (United Nations Environment Programme [UNEP], 2022). Adapting green entrepreneurship is a veritable tool that helps in cushioning the negative effects of unemployment and to mitigate climate change (Organisation for Economic Co-operation and Development [OECD], 2023). Graduates and secondary school leavers who practice agriculture, horticulture in Kaduna metropolis and have passion for green entrepreneurships but do not have enough finances to hire a space, procure local facilities such as water tanks, pumping machines, generators, seedlings and manures to help them start the business enjoys supports from climate change financing or policies gearing towards supporting climate change financing. If this category of household is provided with finances to adapt green entrepreneurship it would assist in the mitigation of climate change, reduce unemployment and would further improve the means of their livelihoods of household (IFAD, 2022; Hall et al., 2010).

Despite the existence of climate finance initiatives and government policies, there are many potential beneficiaries in Kaduna Metropolis who are faced with problems like lack of awareness, lack of funding, bureaucratic red tape, and poor institutional backing. As a result, unemployment levels are very high in the area, whereas the number of green entrepreneurs is still quite low. This has raised doubts about the efficiency of climate finance in mitigating climate change, creating jobs, and improving livelihoods in the study area (National Bureau of Statistics [NBS], 2023).

The objectives of this study are to analyse the impact of climate change financing on the mitigation of climate change and to analyse how climate change financing promotes adaptation of green entrepreneurship, reduces unemployment and promotes job creation in Kaduna metropolis. This study focuses on Kaduna metropolis, and employs survey methods to generate information (data) from respondents. Logistic binary response model was used for data analysis. Furthermore, Key informant interview (KII) was also employed to analyse the perceptions of respondents on the subject matter. The study interviewed selected financial institutions (both public and private), government establishments, private individual and NGOs, to assess their level of participation in promoting and encouraging participation of households in climate change mitigation activities such as adaptation of green entrepreneurship

principles and strategies in Kaduna metropolis.

2.0 Literature Review

2.1 Conceptual Issues

2.1.1 Climate Financing

Buchner et al. (2011) define climate finance as "the flow of funds toward activities that reduce greenhouse gas emissions or help societies adapt to the impacts of climate change." They emphasize that climate finance includes public and private funds, such as grants, loans, and investments, which are directed towards financing adaptation and mitigation activities in developing and developed economies.

Nakhooda et al. (2013) have characterized climate finance as "the financial instruments and mechanisms intended to facilitate the low-carbon, climate-resilient global economy transition." They emphasise multilateral development banks, national governments, and private sector players' role in directing funds to renewable energy ventures, energy efficiency programs, and adaptation programs. It points out concerns with ensuring that climate finance is additive to existing development aid and does not divert much-needed resources away from other priority areas.

Pauw et al. (2020) also define climate financing as "the mobilization and deployment of financial resources to advance climate action, including adaptation and mitigation, in a manner that is consistent with the principles of equity and sustainable development." Climate financing for them has to be human-centered and take special care of vulnerable countries and individuals so that it can provide equal and equitable funding. They also add that international climate funds, for instance, the Green Climate Fund (GCF), must also fill the funding gap in developing countries.

2.1.2 Mitigation of Climate Change

According to Creutzig et al. (2022) Climate change mitigation is "the intentional cutting of greenhouse gas emissions through technological, behavioural, and policy interventions in pursuit of a sustainable and resilient future". They noted the importance of transformation of the energy system, urbanization, and land use changes, and the potential of digital technologies and artificial intelligence to maximize mitigation. Furthermore, they argue that the co-benefits of mitigation, includes reduced air pollution and public health.

Markowitz and Shariff (2022) see mitigating of climate change as "collaborative work to avoid or limit greenhouse gas emission through policy, invention, and lifestyle alteration in order to limit warming to 1.5°Cover pre-industrial levels". The authors address the psychological and social processes required for mitigation and contend

that public engagement, education, and framing morally are the essence of motivating action. They also discuss the necessity of breaking down barriers such as political resistance and economic inequality.

Intergovernmental Panel on Climate Change (IPCC, 2023) observes that climate change mitigation is "the process of reducing the emissions of greenhouse gases and enhancing sinks so as to slow the rate or magnitude of long-term climate change and its impacts". It argues that IPCC strongly advises that the mitigation efforts need to be mainstreamed across various sectors such as energy, transport, agriculture, and industry, aiming for net-zero emissions by mid-century. The study also acknowledges the need for equity and sustainable development to guide the design of mitigation policies so they will not disproportionately harm vulnerable populations.

2.1.3 Green Entrepreneurship Adaptation and Job Creation

Gibbs and O'Neill (2022) reveal that green entrepreneurship adaptation is "entrepreneurs' capacity to adapt to environmental policies, market needs, and social expectations by creating environmentally sustainable business models that minimize ecological traces". This adaptation is most likely to create employment opportunities in new industries like green building, organic agriculture, and circular economy enterprises. The authors identify entrepreneurial education, green financing access, and policy support as the facilitators of the small and medium-sized enterprises (SMEs) to thrive in the green economy.

Schaltegger and Wagner (2023) assert that green entrepreneurship adaptation is "the process whereby entrepreneurs embed environmental sustainability in business models, products, and services in a manner to meet environmental challenges and build economic value". According to them the adaptation is normally synonymous with innovation of renewable energy, reduction of wastes, and environmentally friendly supply chains. Job to this purpose is driven by needs for new occupation and skills for green sectors like solar panel installation, green product design, and environmental consultancy. The authors highlight that green entrepreneurship not only halts environmental degradation but also enhances inclusive economic development.

York and Venkataraman (2023) see green entrepreneurship transformation as "the strategic realignment of entrepreneurial activity to the aims of environmental sustainability, resulting in business action responding to climate change, scarcity of resources, and pollution". Its employment opportunities are spurred by demand for specialized workers in the development of

clean energies, green farming, and innovation in green technology. The writers are of the view that green entrepreneurship is one of the main impulses for low-carbon economic transformation and presents promise for both environmental conservation and economic development.

2.2 Empirical Review

Shadrach and Philip (2025) used a mixed-methods approach with data from the Notre Dame Global Adaptation Initiative's (ND-GAIN) vulnerability index and the Climate Policy Initiative's (CPI) climate finance tracking data set and qualitative interviews with key experts in climate finance and climate risk assessment in Africa to assess the level of risk climate change on Africa in particular areas that are critical to the continent's efforts to achieve its SDGs. The study noted a huge average annual climate financing gap with the use of a Sample-T test to assess climate needs against climate funds received by Africa while establishing an inverse relationship between vulnerability and readiness to adapt to climate vulnerabilities.

Tibi et al (2024) analysed the impact of climate finance on environmental quality in 111 countries worldwide over the period 2000-2019. The study used the generalized method of moments (GMM) in panel data. The main results indicated a positive effect of climate finance on environmental quality, reflecting the theory of financial ecology. Anabaraonye et al. (2024) used mete-analysis to identify the role of green entrepreneurial skills in enhancing the production economy in Nigeria. The study identified that green entrepreneurial skills will help achieve the United Nations Sustainable Development Goals (SDGs) 1,2, 4, and 13. It also showed green entrepreneurial skills as necessary amidst the global challenges of climate change, thereby enhancing the production economy.

Rasheed et al. (2023) explored the influence of climate mitigation finance on climate change in the region most vulnerable to climate shock, such as, South Asia, in the period from 2000 to 2019. Panel autoregressive distributed lag model was used and the findings showed that, in the long-run, climate mitigation finance has a significant role in mitigating climate change, while in the short-run, climate mitigation finance has an insignificant effect on climate change. The result also showed that, in the long-run, climate change has a negative causal relation with GDP and globalization, but it has a positive causal relationship with energy consumption.

Neumann (2022) empirically assessed whether relationships exist between national shares of green entrepreneurial activity (GEA) and economic, social, and

environmental development. Ordinary Least Square regressions were estimated to empirically test the impact of GEA rates (share of total entrepreneurial activity) on GDP, the modified HDI, and CO_2 emissions. For this purpose, Global Entrepreneurship Monitor data for 11,909 early-stage entrepreneurs was aggregated to the macro-level of 53 countries and merged with further international datasets. The results confirmed that higher shares of GEA were positively related to economic and social development but not to environmental development.

Crecente et al (2021) proposed a study of 22 European countries between the years 2014 and 2017. The study used Logit modelling to analyse the impact of circular economy on entrepreneurial opportunities. The study concluded that sustainable entrepreneurship in Europe does not follow a unique model due to the opportunities of Climate change are not taken advance of the same way. Musa et al. (2021) investigated a link between green entrepreneurship and how it can drive employment in a developing economy, being an indicator for sustainable development through green production and services. The study adopted analysis of variance, standard deviation and mean, to show relationship between the variables. The study revealed that green entrepreneurship ultimately added value to a nation's economy, and also brought it closer to reaching its Nationally Determined Contributions.

Makhloufi et al. (2021) examined the effect of green entrepreneurship orientation (GEO) on green innovation performance (GIP), Environmental performance (EP) and the moderating effect of managerial environmental concerns (MEC). The results showed that green absorptive capacity (GAC), environmental cooperation (EC), and MEC significantly affect GEO. Furthermore, GEO positively influences GIP and EP. Indeed, GEO partially mediated GAC, EC, and managerial concern's relationship on green innovation and EP. Additionally, MEC significantly moderated the relationship between GEO and EP. Firms GEO should adequately enhance green practices performance and EP to accommodate their external environment relationships. The study concluded that green innovation development shifts firms from environmental management to sustainable development.

Semenova et al. (2020) assessed the current state of green financing in the Russian Federation from 2000–2018, and the extent of its impact on economic growth in the country. The methods employed were the regression and cluster analysis. The findings revealed that stimulating green financing in Russia required the following: creating a regulatory framework and roadmap for the development of green financing, active state participation

in financing green projects, creating a "green bond market," and a specialized banking institution.

Tarkhanova & Fricler (2020) explored the problematic aspects related to the development of green financing as a basis for sustainable development. Synthesis, analysis and statistical methods were used. The paper examined Russia's Federal State Statistics Service data that described the dynamics and structure of green investment in Russia during 2008–2019. To evaluate the results of green investments, the study compared the green growth indicators taken from the Global Green Economy Index and the Global Innovation Index. An overview of the development of the green financing in Russia demonstrated that the characteristic features of the country's green investment system related to the structure of sources of green financing. In particular, Russian green investments significantly consisted of the companies' own funds. This fact totally contradicted other counties' practice, where the main part of financing was provided by the public sector and specialized manufacturers.

Muhammad et al. (2020) used the difference in differences (DID) method to evaluate the mean causal effects of a treatment on an outcome of the determinants of scaling up green financing and climate change mitigation in the N-11 countries from 2005 to 2019. The study utilised dummy for the treated countries, and was confirmed that the outcome of covariates, renewable energy sources consumption (RESCON), population, foreign direct investment (FDI), carbon emission (CO_2), inflation, technical corporation grants, domestic credit to the private sector, and research and development were very significant in promoting green financing and climate change mitigation in the study countries. The probit regression results gave a different outcome, as RESCON, FID, CO_2, Human Development Index (HDI), and investment in the energy sector by the private sector that will likely have an impact on the green financing and climate change mitigation of the study countries. Furthermore, after matching the analysis through the nearest neighbour matching, kernel matching, and radius matching, it produced mixed results for both the treated and the untreated countries. Either group experienced an improvement in green financing and climate change mitigation or a decrease. Overall, the DID showed no significant difference among the countries.

Benjamin et al. (2019) used meta-analysis to explore the green entrepreneurial opportunities in climate change adaptation and mitigation strategies for sustainable development in Nigeria. The study revealed that there was need for communities, institutions and individuals to embrace green

entrepreneurship which had the capacity to provide green jobs, additional sources of income and green skills to the unemployed youths in Nigeria. The use of climate change poems and blogs in climate change education for sustainable development in Nigeria were also identified as green entrepreneurial opportunities and highly encouraged.

Mohsen (2018) analysed and recognised the impending challenges and opportunities faced by entrepreneurs in Afghanistan. The research used both primary and secondary data, and applied factor analysis and correlation coefficient to analyse the data. The primary data was gathered from 100 business management students through a well-designed questionnaire. The study also encompassed the key drivers for green entrepreneurship in Afghanistan. The findings revealed that growing awareness and demand for organic products amongst consumers, providing a sustainable solution to ecological dangers and prevention of further degradation, and social responsibility were the motivational factor for green entrepreneurship in Afghanistan.

3.0 Methodology

3.1 Study Area

The study area for this research is Kaduna metropolis. The justification for the selection of this area is that Kaduna metropolis comprises of four (4) Local Government Areas, Chikun, Kaduna South, Kaduna North and Igabi. These local government areas host large number of households who are largely involved in raising nursery beds, horticulture, orchard, vegetables garden and other dry season farming. The activities of these households give access to other households to get different plant species such as flowers, mangoes, oranges, banana, apple, to mention but a few.

3.2 Research Design and Data Collection Instruments

The study used multi-stage survey methods, the first stage employed both purposive and random sampling methods for data collection. Purposive method fits the study because the study targets specific households with same characteristics of activities. However, the employment of random sampling method was necessary because the study does not have the ability to study all households in the business due to their population and the cost involved in carrying out the research. Hence, there was need to randomly select respondents that would form the sample for the study. Furthermore, questionnaires were administered to respondent as instrument for data collection from the study areas. However, Focus Group Discussion (FGD) and Key Informant Interview (KII) were employed to obtain information from households, NGOs, politicians, public and private institutions and private individuals

that give supports to stakeholders of green entrepreneurship. The strategies employed gave every respondent equal opportunity of participation.

3.3 Population and Sample Size

Households who registered their green entrepreneurship businesses with the Ministry of Women Affairs and Youth Development in Kaduna state were 548 (Kaduna state Ministry of Women Affairs and Youth Development, 2025). However, Yamane's formula (Yamane, 1963) was used to determine the sample size for the study.

Yamane formula:

$$n = N/1 + (N \times e^2)$$

Where, N = population, n = sample size, e = critical value at 5%

n = 231

Table 3.1: Population and Sample Size

Survey Areas	Population	Sample Size
Kaduna North LGA	176	89
Kaduna South LGA	142	53
Chikun LGA	104	43
Igabi LGA	126	46
Total	548	231

Source: Researchers' Survey, 2025

3.4 Model Specification

The study used logit regressions as tools for analysis.

The logit model is specified as;

$$\text{Log}(P_i) = (\partial_k X_{i,} + U_i) \quad (3.1)$$

Equation 3.1 is a log-likelihood function showing the log-likelihood that climate change financing plays important roles in the mitigation of the impact of climate change; encourages adaptation of green entrepreneurship strategies, to reduce unemployment, promote job creation and to improve the wellbeing of households in Kaduna metropolis. Climate change finance plays significant roles in the mitigation of climate change, reduces unemployment, create job opportunities and improvement in the livelihood of households in Kaduna metropolis given the characteristics of X, where: $P_i = 1$, if the economic wellbeing of household is < Z and $P_i = 0$ if otherwise; ∂_k = Vector of parameters to be estimated; X = Vector of explanatory variables; Z = Variables to be measured

$$CCM = f(CCF) \quad (3.2)$$

$$CCM = CCF + u_i \quad (3.3)$$

$$LOGCCM = \dot{\eta}_0 + LOG\dot{\eta}_1 + u_i \quad (3.4)$$

$$CCF = f(LON, GRT, DNT) \quad (3.5)$$

$$CCF = LON + GRT + DNT + u_i \quad (3.6)$$

$$LOGCCF = \beta_0 + LOG\beta_1 LON + LOG\beta_2 GRT + LOG\beta_3 DNT + u_i \quad (3.7)$$

$$HHW = f(RUE, JCR) \quad (3.8)$$

$$HHW = RUE + JCR + u_i \quad (3.9)$$

$$LOGHHW = \partial_0 + LOG\partial_1 RUE + LOG\partial_2 JCR + u_i \quad (3.10)$$

Where, CCM = Climate change mitigation; CCF = Climate change financing; HHW = Household Wellbeing; LON = Loan; GRT = Grants; DNT = Donations; RUE = Reduction in unemployment; JCR + Job creation; u_i = Error Term

Equation 3.3 is used to analyse the impact of adaption of green entrepreneurship in the mitigation of climate change. This is proxied by climate change mitigation (CCM). Furthermore, Equation 3.7 is used to analyse the impact of climate change financing (CCF). This is proxied by loans (LON), grants (GRT) and donations (DNT) respectively. Household wellbeing (HHW) was proxied by reduction in unemployment (RUE) and job creation (JCR).

4.0 Results and Discussion

This section analyses the impact of climate financing on the mitigation of climate change and the relationship between green entrepreneurship adaptation, climate mitigation, reduction in unemployment and Job Creation in Kaduna Metropolis.

4.1 Presentation of Results

Table 4.1: Analyses of the impact of climate change financing on the mitigation of climate change in Kaduna metropolis

Variable	Coefficient	Std. Error	T-Statistics	Prob (P-Value)	Odds Ratio
C	0.774566	0.032150	24.09248	0.0000	2.1068
CCF	-0.020181	0.064581	-0.312484	0.7550	-0.0549
R-Squared **Adjusted R-Squared** **Prob (F-Statistics)** **Number of Observations**		0.000428 -0.003956 0.097647 230	S.E of Regression Log Likelihood		0.422864 -127.3892

Source: EViews 10 version output, 2025

The study employed the odds ratios of the binary response model in explaining the impact of climate change financing on the mitigation of climate change in Kaduna metropolis. Table 4.1 reveals that climate change financing (CCF) has not been able to reduce climate change in Kaduna metropolis, due to lack of accessibility to climate change financing by stakeholder of green entrepreneurship. With the odd ratio of -0.0549, it was clearly shown that households who practice green entrepreneurship in Kaduna metropolis are -0.0549 times less likely to have access to climate change financing to promote green entrepreneurship for the purpose of mitigation of climate change.

Table 4.2: Analyses of how climate change financing promotes adaptation of green entrepreneurship in Kaduna metropolis.

Variable	Coefficient	Std. Error	T-Statistics	Prob. (P-Value)	Odds Ratio
C	0.233027	0.043020	5.416690	0.0000	0.6338
LON	-0.153834	0.066150	-2.325520	0.0209	-0.4184
GRT	0.003041	0.060570	0.050207	0.9600	0.0083
DNT	0.136003	0.059033	2.303852	0.0221	0.3699
R-Squared **Adjusted R-Squared** **Prob. (F-Statistics)** **Number of Observations**		0.038129 0.025361 0.031998 230	S.E of Regression Log Likelihood		0.427170 -128.7064

Source: EViews 10 version output, 2025

Furthermore, Table 4.2 reveals that adaptation of green entrepreneurship by households in Kaduna metropolis is not well encouraged, due to poor financing or lack of accessibility to finances to mitigate climate change. The results show that households who adapt green entrepreneurship is -0.4184 times less likely to access loans from financial institutions (both public and private), 0.0083 times more likely to access grants from government, private individuals and NGOs, and 0.3699 times more likely to access donations from private individual, government, NGOs, to mention but a few. Their non-accessibility might be due to lack of collateral or high interest rates. Their interest in the accessibility of grants and donations might be due to the current awareness initiated by environmental educators, local and international donors and the interest put by stakeholders in sourcing climate change finances to boost green entrepreneurship and to mitigate climate change.

Table 4.3: Analyses of how adaptation of green entrepreneurship reduces unemployment and creates jobs in Kaduna metropolis

Variable	Coefficient	Std. Error	T-Statistics	Prob. (P-Value)	Odds Ratio
C	0.740159	0.057664	12.83563	0.0000	2.0132
RUE	-0.012173	0.057307	-0212419	0.8320	0.0331
JCR	0,142655	0,061784	2.308924	0.0218	0.3880
R-Squared **Adjusted R-Squared** **Prob (F-Statistics)** **Number of Observations**		0.024460 0.015865 0.060160 230	S.E of Regression Log Likelihood		29.62248 -90.65810

Source: EViews 10 version output, 2025

Table 4.3 also reveals that adaptation of green entrepreneurship by stakeholders has reduced the rate of unemployment and boost job creation in Kaduna metropolis. The results show that adaptation of green entrepreneurship is 0.0331 times more likely

to reduce unemployment in Kaduna metropolis. Similarly, the adaptation of green entrepreneurship is 0.3880 more likely to create more job opportunities in Kaduna metropolis.

Furthermore, interview with Key Informants (KII) reveals that climate change financing has not been able to encourage households in Kaduna metropolis to wholly adapt green entrepreneurship due to poor financing on facilities, seedlings, pesticides and new technology on how to prepare their nursery beds. Sometimes scarcity of water, reservoirs, lack of collateral, high interest rates with short duration usually discourages households from participation. Some respondents argue that lack of commitment by government, politicians and other private organization on climate change mitigation discourage them from making investment on green entrepreneurship. They further argue that lack of enough awareness or information, training and workshops on new technology, methods of new management by experts or climate change educators; teaching them on how to improve or embrace adaptation of green entrepreneurship make the venture un attractive and time wastage.

4.2 Discussion of Findings

The results of this study show that climate change financing does not contribute greatly to mitigating climate change in the Kaduna Metropolis due to the inability of households practicing green entrepreneurship to access climate financing. The result is in agreement with Shadrach and Philip (2025) and Rasheed et al. (2023), which stated that the lack of climate finance is a key barrier to successful climate change mitigation. Nonetheless, the result is in contradiction to Tibi et al. (2024), which claimed that climate finance improves environmental quality. In addition, it was found that the financing of climate change did not adequately facilitate green entrepreneurship adaptation primarily due to the lack of loan facilities, funding, and institutional issues. These results are corroborated by findings of Semenova et al. (2020) and Makhloufi et al. (2021), who pointed out that inadequate financial and institutional frameworks impede green entrepreneurship and environmental sustainability.

Furthermore, the results show that green entrepreneurship helps reduce unemployment and promotes job creation in Kaduna Metropolis. This finding supports the studies of Musa et al. (2021), Benjamin et al. (2019), and Anabaraonye et al. (2024), who found that green entrepreneurship creates employment opportunities, improves livelihoods, and promotes sustainable development. Finally, the Key Informant Interview (KII) findings indicate that inadequate financing, lack of awareness, poor

institutional support, high lending requirements, and weak government commitment remain major barriers to the adoption of green entrepreneurship. These findings further support Shadrach and Philip (2025), who identified insufficient climate finance and institutional weaknesses as key challenges to climate change mitigation.

5.0 Conclusion and Recommendations

From the forgoing, the study concludes that climate change financing has not yet contributed significantly to the adaptability of green entrepreneurship to a level of mitigation of climate change by households in Kaduna metropolis. Hence the study recommends that:

i. Households in Kaduna metropolis who have interest on the adaptability of green entrepreneurship should be encouraged by making them have access to climate change financing, such as loans, grants, and donations by financial institutions (both public and private), politicians, NGOs, etc.

ii. Loans should be provided to households at low interest rate and without collateral to encourage households adapt green entrepreneurship. This will attract many to go into it in order to mitigate climate change.

iii. Training on new technology and environmental education should be part of government policy, and enforcement is very cogent especially now that climate change is ravaging ecosystem.

iv. Intensification on adaptation of green entrepreneurship is necessary in Kaduna state, since adaptation of green entrepreneurship reduce unemployment, and further creates job opportunities. This will go a long way in reducing idleness, crime rates and level of poverty in Kaduna state and Nigeria at large.

References

Adelekan, I. O., Simpson, N. P., Totin, E., & Trisos, C. H. (2022). Africa. In H.-O. Pörtner et al. (Eds.), *Climate change 2022: Impacts, adaptation and vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* (pp. 1285–1455). Cambridge University Press. https://doi.org/10.1017/9781009325844.011

Anabaraonye, B., Onnoghen, N.U., Nwafor, U.G., & Obinna, J.K. C. (2024). The role of green entrepreneurial skills in enhancing production economy in Nigeria. *Covenant Journal of Entrepreneurship (CJoE), 8*(2), 52-57.

Benjamin, A., Okafor J.C., & Chukwuma, M.E. (2019). Green entrepreneurial opportunities in climate change

adaptation and mitigation for sustainable development in Nigeria. *Journal of Environmental Pollution and Management, 2(1), 1-7.*

Buchner, B., Falconer, A., Hervé-Mignucci, M., & Trabacchi, C. (2011). The landscape of climate finance. Climate Policy Initiative.

Crecente, F., Sarabia, M., & del Val, M. T. (2021). Climate change policy and entrepreneurial opportunities. *Technological Forecasting and Social Change, 163*, 120446. https://doi.org/10.1016/j.techfore.2020.120446

Creutzig, F., Roy, J., Lamb, W. F., Azevedo, I. M. L., Bruine de Bruin, W., Dalkmann, H., Edelenbosch, O. Y., Geels, F. W., Grubler, A., Hepburn, C., Hertwich, E. G., Khosla, R., Mattauch, L., Minx, J. C., Ramakrishnan, A., Rao, N. D., Steinberger, J. K., Tavoni, M., Ürge-Vorsatz, D., & Weber, E. U. (2022). Demand-side solutions to climate changemitigation consistent with high levels of well-being. Nature Climate Change, 12(1), 36 –46. https://doi.org/10.1038/s41558-021-01219-y

Food and Agriculture Organization of the United Nations. (2023). *The state of food security and nutrition in the world 2023: Urbanization, agrifood systems transformation and healthy diets across the rural–urban continuum*. FAO. https://doi.org/10.4060/cc3017en

Federal Republic of Nigeria. (2021). *Climate Change Act, 2021*. https://climatechange.gov.ng/wp-content/uploads/2021/11/Climate-Change-Act-2021.pdf

Gibbs, D., & O'Neill, K. (2022). Green entrepreneurship and job creation: A pathway to sustainable development. Environmental Innovation and Societal Transitions, 43, 111 –125. https://doi.org/10.1016/j.eist.2022.05.003.

Hall, J. K., Daneke, G. A., & Lenox, M. J. (2010). Sustainable development and entrepreneurship: Past contributions and future directions. *Journal of Business Venturing, 25*(5), 439–448. https://doi.org/10.1016/j.jbusvent.2009.01.002

Intergovernmental Panel on Climate Change. (2023). *Climate change 2023: Synthesis report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*. IPCC. https://doi.org/10.59327/IPCC/AR6-9789291691647 (IPCC)

International Fund for Agricultural Development. (2022). *Climate finance*. https://www.ifad.org/en/climate-finance

Intergovernmental Panel on Climate Change (IPCC). 2023. Climate change 2023: Synthesis report. Contribution of Working Groups I, II, and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press. https://doi.org/10.59327/IPCC/AR6-9789291691647

Makhloufi, L., Laghouag, A.A., Meirun, T., & Belaid, F. (2021). Impact of green entrepreneurship orientation on environmental performance: The natural resource-based view and environmental policy perspective. *Business Strategy and the Environment*, 1-20, https://doi.org/10.1002/bse.2902.

Markowitz, E. M., & Shariff, A. F. (2022). Climate change and moral judgment. *Nature Climate Change, 12*(2), 87–91. https://doi.org/10.1038/s41558-021-01230-3

Ministry of Women Affairs and Youth Development, Kaduna State. (2025). *Register of associations and community development***.** Kaduna State Government.

Mohsen, A. (2018). Green Entrepreneurship in Afghanistan: Prospects and Challenges. *The Asian Journal of Technology Management (AJTM), 11*(1): 46-56·

DOI: 10.12695/ajtm.2017.11.1.4.

Muhammad, A.N., Usha, S., Pranav, K., Ramaisa A., Ataul, K.P., & Madiha, R. (2020). Nexus Between Green Finance and Climate Change Mitigation in N-11 and BRICS Countries: Empirical Estimation Through Difference in Differences (DID) Approach. *Journal of Environmental Science and Pollution Research, 28,*1-16.

Musa, R., Fadeyi, O., & Taiwo, S. (2021). Green Entrepreneurship and Employment Generation in a Developing Nation: The Nigerian Case. *Journal of Humanities, Arts and Social Science, 5*(1), 81-88. DOI: 10.26855/jhass.2021.01.009.

Nakhooda, S., Norman, M., Barnard, S., Watson, C., Greenhill, R., Caravani, A., Canales Trujillo, N., Hedger, M., Whitley, S., & Banton, G. (2014). *Climate finance: Is it making a difference? A review of the effectiveness of multilateral climate funds*. Overseas Development Institute.

National Bureau of Statistics. (2023). *Nigeria labour force survey 2023*. https://nigerianstat.gov.ng/

National Council on Climate Change. (2022). *National Climate Change Action Plan (2021–2025).* https://climatechange.gov.ng/

Neumann, T. (2022). Impact of green entrepreneurship on sustainable development: An ex-post empirical analysis. *Journal of Cleaner Production, 1-11.*

Organisation for Economic Co-operation and Development. (2023). *SME and Entrepreneurship Outlook 2023*. OECD Publishing. https://doi.org/10.1787/8a5c1b73-en

Pauw, W. P., Bauer, S., & Richerzhagen, C. (2020). Climate finance for developing countries. *Climate Policy, 20*(1), 1–15. https://doi.org/10.1080/14693062.2019.1673892.

Rasheed, N., Khan, D., Gul, A., Magda, R. (2023). Impact Assessment of Climate Mitigation Finance on Climate Change in South Asia. *Sustainability, 15*(6429) 1-19. https://doi.org/10.3390/su15086429.

Semenova, N., Eremina, O., & Skvortsova, M. (2020). Green Financing as a Condition for Sustainable Economic Growth. *Humanities & Social Sciences Reviews, 8*(5), 01-11 https://doi.org/10.18510/hssr.2020.851

Schaltegger, S., & Wagner, M. (2023). Sustainable entrepreneurship and employment creation: Prospects and prospects in the green economy. *Journal of Cleaner Production, 405,* 136 –150.

https://doi.org/10.1016/j.jclepro.2023.136150

Shadrach, B.K., & Philip, A. (2025). Assessing the Nexus Between Climate Finance and State Vulnerability in Africa. *International Journal of Research and Innovation in Social Science (IJRISS)*, *9*(1), 1816-1840.

Tarkhanova E. A., Fricler A. V. (2020). Green financing: Global understandings and Russian practices review. *Journal of New Economy*, *21*(4), 45-62. DOI: 10.29141/2658-5081 -2020-21-4-3.

Tibi, D.Z., Aguima, A.B.L. & Daouda, L.T. (2024). Effect of Climate Finance on EnvironmentalQuality: A global analysis. *HAL Open Science Research in Economics*, 78(4),1-27.

United Nations. (2023). *The Sustainable Development Goals Report 2023: Special edition*. https://unstats.un.org/sdgs/report/2023/

United Nations Development Programme. (2022). *Human Development Report 2021/2022: Uncertain times, unsettled lives: Shaping our future in a transforming world*. https://hdr.undp.org/content/human-development-report-2021-22

United Nations Environment Programme. (2023). *Emissions Gap Report 2023: Broken record—Temperatures hit new highs, yet world fails to cut emissions (again).* https://www.unep.org/resources/emissions-gap-report-2023 (UNEP - UN Environment Programme)

World Bank. (2022). *Nigeria Country Climate and Development Report*. https://openknowledge.worldbank.org/

Yamane, T. (1967). *Statistics: An introductory analysis* (2nd ed.). Harper & Row.

York, J. G., & Venkataraman, S. (2023). Green entrepreneurship and job creation: A framework for sustainable economic development. *Academy of Management Perspectives, 37*(2), 75–90. https://doi.org/10.5465/amp.2022.0123