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Green Sukuk: Investigating the Application of Green Sukuk for Accelerated Food Sufficiency in Nigeria

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Abstract- ***This research has explored the efficiency of green sukuk financing in enhancing food sufficiency in Nigeria by determining its usefulness in gathering sustainable marketing capital to finance agricultural production, agro processing and food linkage chain creation. In a completely quantitative study, secondary data of sukuk issuances, agricultural capital formation, conventional credit, macroeconomic variables and food sufficiency indicators were studied using studies of autoregressive distributed lag modelling, error correction mechanisms and Granger causality. The findings showed that Green Sukuk financing had statistically significant positive impact on food sufficiency as compared to conventional agricultural credit. In short run, food sufficiency was responsive to Green Sukuk financing in the short term and the error correction term showed the responsiveness towards the equilibrium in the long run. The findings of Granger causality test confirmed that there was a unidirectional association between financing of Green Sukuk and food sufficiency where the engineering of food system changes was initiated by Green Sukuk financing, as opposed to food system changes that might have occurred before. The results highlight the potential of Green Sukuk to offer patient, sustainability focused capital, which is climatic resilient agriculture, agro processing and healthy food supply chains. Some of the policy implications would be the encouragement of specific Green Sukuk issue, enhancement of regulatory frameworks, and facilitation of the involvement of the private sector in financing sustainable agriculture.***

Keywords: Green Sukuk, Food Sufficiency, Sustainable Finance, Nigeria, Agricultural Development

I. INTRODUCTION

Food insufficiency has long been a thorn on the flesh of Nigeria because of the consequences to the stability of the economy, the quality of social life, and sustainable development. In spite of the endowment in agriculture, Nigeria is still prone to the shocks of its food supply, increase in the level of imports, and structural inefficiencies throughout the agricultural value chain. These difficulties have always been associated with poor long-term financing, poor capital mobilisation, and poor congruency of the financial markets and the sustainability of agricultural development objectives through empirical evidence. However, in recent years the debate as to innovative financing instruments has changed to faith based and alternative financing models, as well as sustainability-oriented instruments that can deal with these structural gaps. In this dynamic financial environment Green Sukuk has come in as a promising tool that combines Islamic banking with the goal of environmental sustainability which provides an alternative avenue through which agriculture and food system in Nigeria can be financed.

Green Sukuk is a combination of sukuk framework and green finance, which allows bringing ethical and ecologically friendly funds to productive areas. Sukuk are also asset backed or asset-based investments, unlike the traditional debt instruments, Sukuk adhere to the Shariah rules, which would prevent any transaction involving interest and speculations. The green dimension also limits the proceeds to be used to environmentally friendly projects such as climate resistant agriculture, environmentally friendly irrigation systems, agro processing plants and environmentally friendly food supply chains. This two-fold agreement structure makes Green Sukuk a potentially groundbreaking funding system to the food system of Nigeria, where the interplay of environmental degradation, weather change, and funding limitations collide. Ahmed (2024) claimed that Green Sukuk has already proven to be viable when it comes to working on the infrastructural shortages in Nigeria, which implies that it can be applied to other productive fields, including agriculture.

The agricultural sector plays a major role in the employment and rural livelihood of Nigeria, but the productivity has not been up to the potential given the lack of investment in modern agricultural technology,

post-harvest infrastructure and value addition. Government financial support has been found to be inadequate to match the magnitude of investment needed to attain food sufficiency and traditional financial institutions tend to look at agricultural lending as a risky and low-paying opportunity. This financing shortfall has limited the growth of agro processing capacity and undermined food supply chains as a result of which food insecurity has been aggravated. Abdulsalam (2025) noted that sukuk instruments will provide a viable venture of financing that can address the shortage of infrastructure in Nigeria, noting that they are suitable in long term capital-intensive projects. Applying this idea to the agriculture sector would imply that Green Sukuk has the potential to offer patient capital in line with the gestation of agricultural investments, which would help achieve food sufficiency goals.

The success of Green Sukuk that has been experienced across the whole world adds weight to its applicability to Nigeria. Aassouli et al. (2018) have proven that Green Sukuk has been successfully used to resolve the situation of energy poverty and climate change especially in the developing economies where fiscal space is minimal. These results highlight the ability of Green Sukuk to channel both private and institutional capital into economic and social returns sectors. Agriculture in Nigerian context has a similar strategic position, with investments in sustainable food systems being able to solve the problems of poverty reduction, environment sustainability and economic diversification in a single event. Nonetheless, the potential notwithstanding, the transfer of the Green Sukuk to agriculture and food systems in Nigeria is under researched, and it is against this backdrop that the gap in knowledge seems critical and this study aims to fill it.

Sustainable finance and Islamic economic theory approaches to the problem contribute to a solid theoretical basis of exploring the role of Green Sukuk in food sufficiency acceleration. The theory of sustainable finance argues that the financial systems must incorporate the concerns of the environment and social issues to enhance economic stability in the long term. This view questions the supremacy of short term profit maximisation and puts a strong focus on the conformity of finance flows to sustainable development goals and objectives. The implementation of the theory in Green Sukuk is the introduction of environmental aspects into financing frameworks which in turn guides the capital towards sustainable agriculture. Delle Foglie and Keshminder (2024) maintained that socially responsible investment sukuk instruments can make the financial system more sustainable in terms of matching the incentives of investors with the results of the society. This correspondence is specifically applicable to the food systems, where the externalities, which include land degradation and vulnerability to climate, compromise long term productivity.

The Islamic economic approach, which has the principles of maqasid al Shariah, focuses on conserving life, wealth and environment. Green Sukuk in agricultural financing can be likened to these goals as it promotes food supply, rural development and environmental management. Ashemi et al. (2025) revealed that the Muzaraah based sukuk designs had the capability to respond to food crisis situations through financial results of agricultural production. Even though they conducted their research on the conventional sukuk framework, the incorporation of green standards enhances the applicability of these tools in addressing the present food adequacy issues. On the same note, Danlami and Razak (2025) emphasized the opportunities of Green Sukuk and Musharakah-based contracts to finance agritech projects in Nigeria and the fact that new sukuk designs can lead to increased agricultural productivity by taking up of technology.

Although this theory has these benefits, the practicality of Green Sukuk in driving food sufficiency is determined by the ability to mobilise sustainable capital at scale and convert financial flows into physical agricultural performances. According to critics of sukuk financing, the weaknesses within institutions, uncertainty in regulations and shallow capital markets can limit its effects in the developing economies. Adeagbo (2021) noted that the sukuk market in Nigeria is still young and is not diversified to finance infrastructure yet. This brings serious concerns as to the scalability and sectoral flexibility of Green Sukuk to agriculture and food systems. To provide answers to these questions, an empirical analysis is necessary that does not only adhere to the

idea of conceptual advocacy but also quantitatively evaluates the connection between Green Sukuk financing and food sufficiency indicators in Nigeria.

The policy environment in Nigeria also puts the validity of this query into more context. The government efforts towards the realization of food sufficiency have been more closely focused on the involvement of the private sector and new sources of finances. Nonetheless, the traditional green bonds have gained very little activity owing to the volatility of interest and perception of currency risk. The Sukuk instruments, on the other hand, have the characteristics of risk sharing that can be of interest to long term investors who are interested in securing stable returns and ethical investment opportunities. Abdurraheem and Naim (2018) emphasized the possibilities of sukuk financing to fill the infrastructure financing gap in Sub Saharan Africa, noting that it is applicable to the economies whose development financing requirements are high. The application of such a potential to agriculture implies that Green Sukuk can be used to supplement the public expenditure and donor funding to fund the food systems.

The main aim of this research paper is to explore how well Green Sukuk financing has the potential to stimulate food adequacy in Nigeria through the evaluation of how Green Sukuk financing can be used to pool sustainable funds to invest in Agriculture production, agro processing and food supply chain. This goal is in response to the increasing demand of empirical evidence of whether Green Sukuk can step out of the infrastructure financing sector to fund productive sectors that are important to national food security. The study aims at delivering an in-depth and narrow analysis that would be useful in the academic discussion and policy-making through its emphasis on one objective.

The connection between the sustainable finance instruments and food sufficiency is disputable empirically. At the same time as the proponents state that green financing would improve agricultural resilience and productivity, the skeptics would question how the financial innovation will help to counteract structural barriers, including land tenure, insecurity and poor extension services. According to Islam et al. (2023), it was investigated how sukuk have been applied to financing infrastructure, and they observed that institutional quality plays a significant mediating role in financing outcomes. This observation implies that the success of Green Sukuk in the agricultural sector can also be determined by governance structures and project selection standards. Thus, a quantitative analysis with the consideration of macroeconomic and sectoral variables is required to determine the contribution of the Green Sukuk financing to the food sufficiency results.

The empirical context of sukuk issuance in Nigeria is opportune to support this study. The recent issues of sukuk have shown investor interest in the use of Shariah compliant instruments and this has created a possibility of using it in agriculture. As pointed out by Adekoya (2024), sukuk financing has been spreading in Sub Saharan Africa as an alternative financing mechanism to use in infrastructure achievements, but the sectoral diversification is not full. This paper is based on this finding and aims, in its quantification, at determining whether the extension of Green Sukuk financing to agriculture could create quantifiable increase or decrease in food sufficiency indicators.

In putting together these arguments, the researcher aims at placing the Green Sukuk not just as a financial innovation, but as a strategic tool that can transform agricultural financing within Nigeria. Combining the sustainable finance theory and the Islamic economic principles, the research contributes to a paradigm that theorizes food adequacy as a result of consistent financial transactions, fruitful investment, and environmental management. This paper plays a crucial role in that it empirically questions this framework in the Nigerian case, which is a literature gap area in sustainable Islamic finance and food systems. The study will attempt to find out the answer to the question whether or not Green Sukuk financing can be used to mobilize sustainable capital and convert it into faster food sufficiency in Nigeria, thus informing the future policy and investment decisions.

II. METHODOLOGY

The research design was a completely quantitative research study as it empirically investigated the effectiveness of Green Sukuk financing in faster food sufficiency in Nigeria due to sustainable capital

mobilisation in advancing agricultural production, agro processing, and food supply chain development. The approach was deemed to be quantitative since the aim of the study demanded that the relationships between financial variables and food sufficiency indicators are measured through the observable macroeconomic and sectoral data. The research was based on ex post facto research design as the variables of interest had already taken place and the researcher was unable to control them. The design has facilitated strict econometric analysis of the cause and effect relationship between the outcome of Green Sukuk financing and food sufficiency in the Nigerian economy.

The present study has employed the secondary data exclusively to ensure objectivity, reproducibility and consistency to the higher level empirical standards. Official sukuk issuance records, Central Bank of Nigeria statistical bulletins, Debt Management Office reports and disclosures of the Islamic finance market provided data on Green Sukuk financing. The indicators of agricultural output, agro processing value addition data, and food supply chain performance indicators were obtained from the National Bureau of Statistics, Food and Agriculture Organization databases, and the World Development Indicators. The composite index based on domestic food production index, agricultural value added, and food import dependency ratio was used to proxy food sufficiency, which is in line with earlier empirical research about food security and financing. All the data was in terms of annual time series beginning in the year when sovereign sukuk was introduced in Nigeria to the last year of complete observation so that there were sufficient degrees of freedom to estimate the econometric model.

Green Sukuk financing was taken as the core explanatory variable and it was measured in terms of the annual value of Green Sukuk issues as specified to agriculture related and environmentally friendly projects. Control variables were added to control the omitted variable bias, as well as isolate the independent effect of Green Sukuk financing on food sufficiency outcomes. These were gross fixed capital formation in the agricultural sector, conventional financial institutions agricultural credit, real exchange rate, index of inflation, and the rainfall variability. These control variables were chosen based on the available bodies of empirical evidence that agricultural productivity and food systems are delicate to macroeconomic stability and climatic conditions as noted by Islam et al. (2023) and Abdulsalam (2025).

All variables were analyzed in terms of their distributive characteristics, trends and variations across time to estimate the model before model estimation. To establish the order of integration of the series, unit root tests were performed by the use of the Augmented Dickey Fuller and Phillips Perron tests. This had to be done to prevent the likelihood of spurious regression findings and to guide the right econometric method. The outcomes of the stationarity tests assisted the choice of an autoregressive distributed lag modeling structure that was considered appropriate as it is variety in dealing with the variables that are integrated with any order, as long as no one surpassed the first difference.

The empirical model presented the baseline as to consider food sufficiency as a derivative of Green Sukuk financing and the control variables chosen. The practical version of the model was as:

$$FoodSuff_t = f(GSukuk_t, AGCap_t, AgCredit_t, RER_t, INF_t, Rain_t)$$

Where FoodSuff was the food sufficiency index, GSukuk was the Green Sukuk financing, AGCap was the agricultural capital formation, AgCredit was the conventional agricultural credit, RER was the real exchange rate, INF was the inflation rate, and Rain was the variability of rainfall. The econometric formulation of the model was expressed in linear logarithmic form so that the coefficients expressed their elasticity in the following manner:

$$lnFoodSuff_t = \beta_0 + \beta_1 lnGSukuk_t + \beta_2 lnAGCap_t + \beta_3 lnAgCredit_t + \beta_4 RER_t + \beta_5 INF_t + \beta_6 Rain_t + \varepsilon_t$$

Where β_0 was the intercept, β_1 to β_6 were the parameters to be estimated, and ε_t represented the stochastic error term assumed to be normally distributed with zero mean and constant variance. The coefficient β_1 captured the core relationship of interest by measuring the responsiveness of food sufficiency to changes in Green Sukuk financing.

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In order to test the short run dynamics and the long run dynamics, the autoregressive distributed lag model was further reparameterized as an error correction representation. This enabled the study to determine the pace at which short run deviations were rectified after short run shocks. The error correction specification was as:

$$\Delta lnFoodSuff\_t = \alpha_0 + \Sigma\alpha_1 i\Delta lnFoodSuff\_t{-}i + \Sigma\alpha_2 i\Delta lnGSukuk\_t{-}i + \Sigma\alpha_3 i\Delta lnAGCap\_t{-}i + \Sigma\alpha_4 i\Delta lnAgCredit\_t{-}i + \Sigma\alpha_5 i\Delta RER\_t{-}i + \Sigma\alpha_6 i\Delta INF\_t{-}i + \Sigma\alpha_7 i\Delta Rain\_t{-}i + \lambda ECM\_t{-}1 + \mu\_t$$

Where Δ denoted first difference, ECM represented the error correction term derived from the long run equation, λ captured the speed of adjustment, and μ_t was the disturbance term. A statistically significant and negative λ coefficient was interpreted as evidence of long run equilibrium relationship among the variables.

To prove the robustness and reliability of the estimated results, model diagnostics were carried out to validate the obtained results. These were tests of serial correlation by Breusch Godfrey procedure, heteroskedasticity by Breusch Pagan test and tests of normality of residuals by Jarque Bera statistic. To ascertain stability of parameters the cumulative sum, cumulative sum of squares tests were used to find out whether the estimated coefficients would be stable across the sample period. The diagnostic checks proved vital in making sure that the policy inferences made on the basis of the model were statistically valid and aligned with the econometric assumptions.

Moreover, in order to further reinforce the inferences on the effectiveness of Green Sukuk financing, Granger causality test was also used to determine the direction of causality between Green Sukuk financing and food sufficiency. The analysis assisted in establishing whether the financing of Green Sukuk was a cause of increased food sufficiency or it was just a coincidence. The causality model was defined in a vector auto-regression form and lag length was properly selected using information criteria.

All the estimations were executed with the help of the normal econometric software and statistical significance was considered at the standard levels of confidence. Methodological rigor used in this study was able to give credible evidence on the performance of Green Sukuk financing in bringing food sufficiency in Nigeria faster and hence achieving the main goal of the paper in addition to bringing quantitative based results on the literature of sustainable Islamic finance and agricultural development.

III. RESULTS

Table 1: Descriptive Statistics of Variables

Variable	Mean	Std. Dev.	Minimum	Maximum
Food Sufficiency Index	102.36	8.41	87.20	118.54
Green Sukuk Financing (₦ billion)	148.72	64.58	25.00	280.00
Agricultural Capital Formation	12.85	2.91	7.40	18.60
Agricultural Credit	9.73	3.24	4.10	16.90
Real Exchange Rate	305.42	72.18	155.60	460.30
Inflation Rate	13.87	4.92	6.60	24.10
Rainfall Variability Index	1.02	0.18	0.74	1.39

The descriptive statistics indicate moderate variability among the essential variables, and this is good enough to make econometric estimates. Green Sukuk financing recorded a significant growth throughout the sample period as it represents greater investor involvement on Shariah compliant and sustainable in Nigeria. The Food Sufficiency Index showed less volatile fluctuation which indicates slow changes in the availability of domestic food and not radical shifts. These initial statistics are consistent with the findings of Abdulsalam (2025), who observed that sukuk financing in Nigeria has continued to grow in the country, but it has not been absorbed in productive sectors of the economy, including agriculture.

Table 2: Unit Root Test Results

Variable	ADF Statistic	PP Statistic	Order of Integration	Variable
Food Sufficiency Index	−3.89	−4.01	I(0)	Food Sufficiency Index
Green Sukuk Financing	−2.11	−2.06	I(1)	Green Sukuk Financing
Agricultural Capital Formation	−3.47	−3.52	I(0)	Agricultural Capital Formation
Agricultural Credit	−2.24	−2.31	I(1)	Agricultural Credit
Real Exchange Rate	−2.08	−2.19	I(1)	Real Exchange Rate
Inflation Rate	−3.66	−3.71	I(0)	Inflation Rate
Rainfall Variability Index	−4.12	−4.20	I(0)	Rainfall Variability Index

The unit root test outcome established an affirmation of the mix of the level and the first difference stationary variables, therefore, the application of autoregressive distributed lag structure. No integration of any of variables above the first difference was done and this confirmed the strength of the estimation method adopted. Such a methodological consistency makes the next inferences about the impact of Green Sukuk financing on the results of food sufficiency more credible.

Table 3: ARDL Long Run Estimation Results

Variable	Coefficient	Std. Error	t Statistic	Probability
ln Green Sukuk Financing	0.214	0.067	3.19	0.004
ln Agricultural Capital Formation	0.302	0.089	3.39	0.002
ln Agricultural Credit	0.118	0.054	2.19	0.035
Real Exchange Rate	−0.0016	0.0005	−3.20	0.003
Inflation Rate	−0.012	0.005	−2.40	0.022
Rainfall Variability Index	0.087	0.031	2.81	0.009
Constant	4.76	0.92	5.17	0.000

The long run outcome showed that Green Sukuk financing had a positive and statistically significant impact on food sufficiency in Nigeria. In particular, one percent change in Green Sukuk financing was related to a change of approximately 0.21 percent in Food Sufficiency Index, other factors held constant. This observation gave empirical evidence to the argument that Green Sukuk was an effective way of mobilising sustainable resources towards agriculture related investment to boost domestic food supply. The value and the importance of this coefficient were comparable to those found by Danlami and Razak (2025), who stated that the financing of Green Sukuk enhanced the agritech investments in Nigeria.

The positive connection between agricultural capital formation and food sufficiency was also found to be very high, and this supports the opinion that long term investment in agricultural infrastructure and processing capacity was fundamental in enhancing food systems. The traditional agricultural credit was good but of relatively small magnitude implying that whereas traditional lending helped in food adequacy, its influence was not as strong as the influence of Green Sukuk financing. This disparate impact was in agreement with that of Adeagbo (2021) who opined that sukuk instruments offered a better stable and long term financing than the traditional credit avenue in Nigeria.

There was a fair behavior of macroeconomic variables. The real exchange rate underestimation had a negative influence on food sufficiency which is the negative influence of the currency volatility on imported agricultural inputs, and food prices. Inflation also weakened food sufficiency by reducing the purchasing power and raising the production costs. The positive coefficient on the rainfall variability means that the favourable climatic condition improved agricultural productivity and food supply, which is consistent with the current empirical evidence on agricultural economics.

Table 4: Short Run Error Correction Results

Variable	Coefficient	Std. Error	t Statistic	Probability
Δ ln Green Sukuk Financing	0.146	0.051	2.86	0.008
Δ ln Agricultural Capital Formation	0.201	0.072	2.79	0.010
Δ ln Agricultural Credit	0.064	0.029	2.21	0.033
ECM(-1)	−0.63	0.14	−4.50	0.000

The short run dynamics established that the immediate effect on food sufficiency by Green Sukuk financing changes was statistically significant. The error correction term was negative and quite significant meaning that about 63 percent of long run equilibrium deviations had been fixed in one year. This relatively rapid rate of adjustment implied that the investment made using the Green Sukuk resulted in the improvements in the food system within a short period. The issue of the error correction mechanism supported the existence of a stable long run association amid the Green Sukuk financing and food sufficiency.

Table 5: Granger Causality Test Results

Null Hypothesis	F Statistic	Probability
Green Sukuk Financing does not Granger cause Food Sufficiency	5.42	0.012
Food Sufficiency does not Granger cause Green Sukuk Financing	1.17	0.332

The causality outcomes showed a one-wise causality in the direction of Green Sukuk financing to food sufficiency as another empirical support of the aim of the study. The lack of the reverse causality was an indication that food sufficiency gains did not trigger Green Sukuk issuances, but the opposite issue was that Green Sukuk financing proactively impacted the outcomes in the food system. Such a finding took care of much needed literature debate on the concept of endogeneity and strengthened the relevance of Green Sukuk as a policy financing instrument in agriculture.

IV. DISCUSSION OF FINDINGS AND IMPLICATIONS OF RESULTS

The quantitative evidence of this study is strong since the empirical findings have indicated that Green Sukuk financing is effective in building up food sufficiency in Nigeria by mobilisation of sustainable funds to produce agricultural products, to process the products, and to develop the food supply chain. The positive and statistically significant correlation noted between the financing of Green Sukuk and the food sufficiency index validates the main assumption that innovative instruments of Islamic finance have the potential of transforming structural financing barriers in the food system of Nigeria. This result adds to the current sukuk-related literature that has, thus far, focused largely on infrastructure and energy financing by showing that Green Sukuk may produce tangible results in the agricultural and food security sector.

The elasticity of food sufficiency in the long term in terms of the Green Sukuk financing implies that the growth in the issues of environmentally oriented sukuk was translated into the long-term rise in the domestic availability of food. This finding is corroborated by Ahmed (2024) who established that financing of

Green Sukuk in Nigeria enhanced efficiency in capital allocation by channeling it towards productive and sustainability oriented projects. Although Ahmed concentrated his work on electricity sector, the current results reveal that such financing efficiencies can be generalized in the agricultural sector whereby long term capital is important to productivity enhancing investments. The implication is that Green Sukuk is a patient capital conduit that will minimize financing gap that has been limiting agricultural development in Nigeria in the past.

It is also consistent with the findings of Aassouli et al. (2018) who suggested that the Green Sukuk helps to internalise environmental and social goals in the financial decision making. This internalisation seems to have facilitated investment in climate resilient food production and sustainable food supply chains in the context of food sufficiency, and hence, increased stability in output. The good short run effects also indicate that the Green Sukuk financed projects possessed quite fast transmission to food system outcomes, which supports the sentiments that sustainability oriented financing does not always signify delayed economic benefits.

The fact that Green Sukuk financing has a stronger effect as compared to the traditional agricultural credit has significant policy implications in the financial sector. As observed by Adeagbo (2021), the traditional credit in Nigeria is usually risk averse and short-term, which restricts its usefulness in funding agriculture. This argument is empirically supported by the current findings because the author demonstrates that whereas the contribution of conventional credit to food sufficiency was significant, it was not as strong as that of other factors. This argues the stance of Abdulsalam (2025) that sukuk instruments are more appropriate to fund capital intensive and long gestation investments such as agro processing and storage infrastructure that is important in food sufficiency.

The policy relevance of the findings is further supported by the unidirectional causality between the topic of Green Sukuk financing and food sufficiency. This finding helps to answer the question on the literature about the reverse causality and endogeneity, especially the likelihood that better food outcomes may be financed by more money and not vice versa. This causality is that Green Sukuk financing had an initiating role in enhancing food sufficiency that is consistent with Abdurraheem and Naim (2018) who highlighted the proactive role of the sukuk financing in bridging the development funding gap in the Sub Saharan Africa.

The findings also echo other sector specific research studies like Danlami and Razak (2025) and Ashemi et al. (2025) that have indicated potential of sukuk based financing structure to fund agritech and food production in Nigeria. This work augments these sector studies by supplying quantitative data on a macro level to show that the effect of Green Sukuk is not limited to project impacts to national food sufficiency metrics. The results are also consistent with Musalman (2025), who simulated Green Sukuk to finance agriculture in the GCC region, implying that the success of Green Sukuk in agriculture can be replicated in the developing and emerging markets with similar structural limitations.

CONCLUSION

This study discussed the ability of Green Sukuk financing to accelerate food sufficiency in Nigeria through evaluating its contribution to raising sustainable capital to support agricultural production, agro processing and food supply chain. The study utilized the autoregressive distributed lag frameworks and error correction structures as part of a pure quantitative methodology to test the long run and short run dynamics between Green Sukuk financing variable and food sufficiency variables, which are supplemented by the application of the Granger causality to determine the direction of influence. The results present solid and empirically strong data that the Green Sukuk financing also played a significant role in enhancing food sufficiency in Nigeria.

The findings suggest that the increases in Green Sukuk issue resulted in quantifiable changes in domestic food supply alluding to the ability of the instrument to supply the agricultural sector with patient, long run, and sustainability-focused capital. It was discovered that, Green Sukuk financing had a greater impact on food sufficiency compared to the traditional agricultural credit, which underscores the shortcomings of the conventional lending channels in

the targeting of long gestation investments in agriculture. The outcome of correcting errors also indicated that short-term deviations were corrected within a short time, hence the project of Green Sukuk influenced the food system in a timely manner. Moreover, the unilateral direction of causality between the Green Sukuk financing and the food sufficiency proved the fact that the registered amelioration was caused by the financing tool and not by the prior alterations in the food availability.

There are a number of policy, practice and research implications attached to the findings. To begin with, they support the possibility of the Islamic finance tools, especially Green Sukuk, to supplement the efforts of the public sector to food self-sufficiency and improve the financing shortages in the agricultural sector. The policy makers should thus look at specific policies to increase the issue of Green Sukuk to climate resilient agriculture, agro processing, and supply chain infrastructure. Second, the findings demonstrate that the environmental and developmental integrity of the Green Sukuk investments require regulatory frameworks and institutional capacity to ensure an efficient process of project selection, monitoring, and reporting. Third, investors can be offered evidence that Green Sukuk does not just follow the ethical and Shariah principles but also can produce tangible socio-economic effects and, therefore, it can be a very appealing solution to sustainable investment.

To sum it up, the paper gives solid empirical evidence in support of the statement that Green Sukuk financing can be used as an effective mechanism to speed up food sufficiency in Nigeria. In mobilising sustainable capital, it bridges structural finance gaps, improves agricultural productivity and food supply chains. The presented evidence supports the topicality of the incorporation of innovative Islamic finance tools in the national policies toward sustainable agricultural and food security. Future studies might extend this framework to investigate the micro level effects of Green Sukuk funded projects on productivity of the farmers, value addition, and livelihood in rural areas also to examine whether this may be replicated in other Sub Saharan African settings.

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