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Role of Staple Food Production in Ensuring Food Security in Nigeria

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

The study investigated the role of staple food production in ensuring food security. The study investigated role of staple food production in ensuring food security in Nigeria. The objectives of this study are to: determine the impact of staple food production on gross domestic product of crops in Nigeria, investigate the value of government guaranteed agricultural loan to farmers on agricultural production in Nigeria, and examine the value of food import bill on total value of import of Nigeria. The study employed time series data. Data is generated from the Central Bank of Nigeria and the National Bureau of statistics bulletin. The study employed the ordinary least square (OLS) of simple regression. The study conducted both econometric and statistical tests. The empirical results showed R^2 value of 0.24,053 and 0.22 for models 1-3 respectively. The three models are rightly signed. The coefficient (β) of 0.1631 (model 1) showed that 100% increase in staple food production would lead to a 16.31% increase in gross domestic production of crops (GDPC). Since the computed t-value of 3.102765 falls outside the critical region of $\pm$ 0.0042, we reject the null hypothesis and accept the alternate hypothesis at 5% level of significance. The model 3 test showed that the total import bill (TIMB) was significantly sensitive to variation in the food import bill (β=30.7422). The result confirms that 30.7% of the variation in total import bill was accounted for by the food import bill. Based on the results, the study recommended that emphasis should be placed on one hand and ensuring food security (self-sufficiency) in general.

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1. INTRODUCTION

Over the past decades, food security has become the common parlance in the way in which food and agriculture policies in many developing countries, as well as calls for various international agreements are justified. At the national level, food security can be broadly defined as "the ability of a country to meet consistently and without excessive expenditure, its yearly domestic food requirement" [1].

As part of the efforts to ensure that the majority of the populations do not go to bed hungry, many African governments aim at self-sufficiency in the production and supply of major food items as priority goals. But then, it has now been realized that self-sufficiency largely supported by external assistance, even for selected food items, is neither attainable nor subsistence [2]. For instance, when major achievements were made in the production and supply of a major commodity it was found that individual's household access to food, notably economic, was not always ensured. In the present-day Nigeria, the majority of people in urban centers are facing lots of hardships, especially on how to feed themselves.

The issue of food security has been on the forefront of developmental sciences for many decades. Food security exists when all people at all times have access to safe nutritious food to maintain a healthy and active life [3-8]. There exist four major elements in assessing food security, namely, availability, accessibility, utilization and sustainability. While availability connotes the physical presence of a large quantity of food, accessibility implies that there is the ability to acquire the required quantity; utilization/adequacy means sufficiency in both quantity and quality of food; and sustainability implies access at all times and not losing such access. Nwaniki, [9] assert that food crisis and food related emergencies have led to malnutrition and mortality. Different agencies and developmental projects have defined and measured food security/insecurity status of different countries, groups and social classes. There have been analysis of the food security status of whole regions and countries; however, there is now a shift to understanding the food security state of households, for whom policies can be enacted to give effective change to the national, regional and international profile of food insecurity issues.

Of the two-crisis disturbing the world economy i.e. financial crisis and soaring food prices, the latter is the more disturbing in many developing countries. the paradox is that the highest quartile of the food insecure live in rural areas where food is produced, yet they are net food buyers rather than buyers. The three frontiers that constitute basic necessities of life, include food, shelter and clothing. It suffices therefore to say that, all that governance requires is the formulation of policies and strategies that would articulate a road-map towards primarily, achieving successes in the provision of basic necessities for the citizenry of any country especially in the area of food security but the reverse is the case.

1.1 Statement of the Problem

In spite of the growing importance of oil, Nigeria has remained essentially an agrarian economy with agriculture still accounting for a significant share in gross domestic product (GDP) and total exports as well as employing the bulk of labour-force (Szirmai [3]. The population of Nigerians involved in farming is between 60%-70%, yet there is threat to hunger and poverty.

About 70% of Nigerians live on less that N100 or US$0.7 per day (Ihimodu, 1986). Attainment of food security is a fundamental national agricultural objective in Nigeria. This is to ensure that households have access to good and nutritious food for healthy living.

Base on this problem, small farmers tend to consider some vital factors which influence their loan sources and the amount of loan to be demanded from formal and informal sources of loan. These factors may be farmer related, institutional or political factors associated with the farmer's credit worthiness. Among these factors include farm size, and non-farm income.

Production loan for small farmers is one of the key factors needed for increased agricultural productivity [4]. On the other hand lack of loan reduces farmer's abilities to adopt new and better techniques of production. In a nut shell; income is the most important factor that affects food security. Furthermore, the problems of cultural barrier also affect food security in some areas. Beaulac et al. [5] reveal among other factors that linguistically isolated families (cultural barrier) in rural area have a disadvantage in food access.

Again, cultural discrimination of certain class of people regarded as second-class citizens of the community makes the class of people not to acquire enough land for agricultural crop production. In some cases, they are either deprived or made to pay exorbitantly for the farm land.

Other problems of food security in Nigeria include larger family sizes, transportation problem (especially in the rural riverine swampy areas) were boats are the only means of movements (poor access to market) storage facilities (large quantities of newly harvested crops, especially vegetable sand fruits are sent and sold in the market during harvest).

Unemployment's of youths is a problem which has shown its ugly face against food security in Nigeria. This has induced the young people to migrate urban centers in search of white-collar jobs. This means only feeble and old people are left in the rural arear to till the ground for agricultural productivity.

Based on the above problems the study shall address the following research questions. What is the impact of staple food production on gross domestic product of crop in Nigeria, what is the value of government guaranteed agricultural loan to farmers on agricultural production in Nigeria, what is the value of food import bills on total value of import in Nigeria. The need to address this huge problem also led to the following questions. How do rural households meet their food need? What are the contributions of farming to a household's income? What are the determinants of a household's food security in Nigeria?

1.2 Objective of the Study

The specific objective of the study are stated as follows:

1. Determine the impact of staple food production on Gross Domestic Product (GDP) of crop in Nigeria.
2. Investigate the value of government guaranteed agricultural loan to farmers on agricultural production in Nigeria, e.g. Agricultural Credit Guarantee Scheme Fund (ACGSF), Agricultural Support Scheme (ACSS), Commercial Agricultural Credit Scheme (CACS).
3. Examine the value of food imports bill on total value of import in Nigeria

1.3 Statement of the Hypothesis

The hypothesis supporting the study are as follows:

$H0_1$: There is no significant relationship between staple food production and gross domestic product of crop in Nigeria.
$H0_2$: There is no significant relationship between values of government guaranteed agricultural loan to farmers and agricultural production in Nigeria.
$H0_3$: There is no significant relationship between the value of food imports bill and total value of import in Nigeria.

1.4 Significance of the Study

The Government of Nigeria has been trying to achieve food security at both household and national level through various agricultural policies in Nigeria. Various factors contributing to National and household food security were discussed so that recommendations can be made for better strategies and measures to assist communal and National government address household food insecurity in Nigeria. The findings from the study will help government to know the impact of its agricultural policy on staple food production and how it has affected the gross domestic product in Nigeria. It will also expose the value of its financial policy on crop production in Nigeria. The findings of this study will add to the stock of existing knowledge.
The study will benefit the common man, as the government pursues it agricultural policies efficiently and effectively leading to the production and provision of enough food at affordable rate. Also, the effectiveness of extension services (through better conditions of service, incentives and favorable environment) will lead to increase in staple food production. This is because the extension personnel who is well motivated will discharge his/her duties effectively.

Government policy on agriculture is one of drift as intended information never reached the right target population in the right time. Mafukidze and Hoosen [6] states that a common reason for a failure of a number of development program was that sufficient care has not been taken to relate the innovation to the farmer and the environment. Hence this study will geared towards finding out the reason for the bridge in the information form getting to the rural farmers.

2. RESEARCH METHODS

2.1 Research Design

The research design for the study is both descriptive and analytical. Descriptive research is that research which specifies the nature of a given phenomenal this implies a systematic explanation of a situation while quantitative analysis involves the use of dependent and independent variables in a simple regression model.

2.2 Data Collection Methods and Sources

The study is based on purely on time series. Data were collected from secondary sources, which includes Federal Ministry of Agriculture, the Central Bank of Nigeria Statistical Bulletin, 2012, the World Bank indicators for Nigeria and the National Bureau of Statistics Bulletin. The data which are secondary in nature covered the period between 1981 and 2012. The data included are those on staple food, import bill, Gross domestic product and Government guarantee agricultural loans from banks and agricultural production.Simple.

2.3 Estimation Techniques

The Ordinary Least Squares (OLS) technique which is a best linear and unbiased estimator was used to analyze data on the impact of food security, agricultural production and gross domestic production in Nigeria. The econometric software of E-view was used for running the model. The R^2 is the coefficient of determination and the goodness of fit test. It is used to test the total variation in the dependent variables that has been explained by the independent variable taken together. The R^2 can assume any value, but an R^2 of 50% and above is considered appropriate. This does not invalidate an R^2 with a lower or even negative value.

2.4 F-Statistic

The F-Statistic is used to test the overall significance and model utility. The decision rule is that if the F-calculated > F-critical, it signifies an acceptance of the directional hypothesis. The reverse is the case if the F-calculated < F-critical.

2.5 T-test

The t-test is used to test the statistical significance of each independent variable in explaining variable. The decision rule of the t-test is that if the t calculated > t critical, the particular variable is statistically significant in explaining variations in the dependent variable. The variable is not statistically significant if the t – calculated -<t critical.

Durbin Watson Test

The Durbin Watson test is used to detect the presence of autocorrelation from the analysis. The decision rule is that if the

DW calculated >2: Negative Serial Correlation
DW calculated <2: Positive Serial Correlation,
DW calculated =2: No Serial Correlation

2.6 Model Specifications

The study adopted the ordinary least square of simple regression. The model for the study is stated functionally below:

$$GDPC = f(SFP) \quad 3.1$$

We transform model 1 as

$$GDPC = ao + a_1SFP+Ut \quad 3.2$$

$$AGP = f(VFCLG) \quad 3.3$$

We transform model 2 as

$$AGP = Bo + b_1VFCLG +Ut \quad 3.4$$

$$TVIMB = f(FIMB) \quad 3.5$$

We transform model 3 as

$$TVIMB = co + c_1FIMB + Ut \quad 3.6$$

Where:

GDPC = Gross domestic product of CROPS (N" million)
AGP = Agricultural production (000" tons)
TIMB = Total value of import in Nigeria (N" billion)
SFP = Staple food production (000" tons)
FIMB = Food import bill (N" million)
VCLG = Value of government guaranteed Agricultural loan to farmers (N" billion)
Ut = random variable

$a_1>0$
$b_1>0$
$c_1>0$

Economic theory suggest that increase in staple food production, value of government guaranteed agricultural loan to farmers and population will increase gross domestic products of crops and agricultural production in Nigeria. Also increase in value of food import bill will lead to total value of import in Nigeria.

3. RESULTS AND DISCUSSION

This represents the data that were used in the estimation of the model specified in chapter three of this work. The chapter, in essence provides empirical tests and analysis of relevant data, and a discussion of the findings. This will help us to achieve the stated objectives in chapter one of the study.

3.1 Data Presentation of Data Set on Agricultural Production and Economic Growth in Nigeria

This study utilized times series data relating to the variable sunder study (dependent and explanatory variables). The research study considered a time period of 1981 – 2012. The data were sourced from Central Bank of Nigeria statistical bulletin and National Bureau of Statistics office.

The result in model 1 indicate a beta coefficient (β) of 0.1613 showed a 100% increase in staple food production would lead to a 16.13% increase in the Gross Domestic Product of crops production (GDPC). Since the compound t-value of 3.102765 falls outside eh critical region of $\pm$ 0.0042 we reject the null hypothesis, and accept the alternate hypothesis at the 5% level of significance. The r^2 (coefficient of determination)showed t-cal 24.29% of the variation in GDPC significantly explained by changes in the level of staple food production (SFP).

The model 2 result showed the value of government guaranteed agricultural loan, explaining 53.07% of the variation in agricultural production at the 5% level of significance.

The model 3 test showed that the total import bill (TIMB) is significantly sensitive to variation in the food import bill ($\beta = 30.7472$). The F-ratio results confirm that 22.31% of the variation in total import bill is accounted for by the food import bill.

Table 1. Model one-staple food production/gross domestic product of crop-SFP/GDPC

Variables (IV_S)	**Beta Coefficient (β) t-cal f-Statistic Criticla region**	**Std Error Level of Significance Durbin Watson DW Coefficient (r^2)**
SFP Independent	0.1631 3.102763 9.6277 $\pm$0.0042	0.052586 5% 0.672
GDPC Dependent	16.31%	24.29%

Table 2. Model Two-value of government guaranteed agricultural loan/agricultural production-VFCLG/AGP

Variables(IV_S)	**Beta Coefficient (β) t-cal f-Statistic Std Error**	**Level of Significance Durbin Watson DW Coefficient (r^2)**
VFCLG Independent	5.824662 33.9266 5%	0.554 2.95%
AGP Dependent	53.07%	5%

Table 3. Model three-food import bill/total import bill-FIMB/TIMB

Variables (IV_S)	Beta Coefficient (β) f-Statistic Std Error Durbin Watson	F-ration
FIMB Independent	(β)=30.7472 8.3290 10.65387 2.290	
TIMB Dependent	30.74719	22.31

3.2 Summary

The study examines the role of staple food production in ensuring food security in Nigeria from 1981 – 1012. The importance of the role of the agricultural extension personnel was viewed vigorously, the factors militating against the proper functioning of the change agent (extension personnel) is also review. The specific objective of the study is to analyses the role of staple food production in ensuring food security in Nigeria. The findings also showed that;

(i) In the short run, staple food production is positively and significantly related to gross domestic product of crop production in Nigeria. The policy implication of this finding is that increase in staple food production will lead to increase in gross domestic product of crop production in Nigeria hence food security in Nigeria.
(ii) In the short run, value of agricultural guarantee loans (VFCLG) is positively and significantly related to agricultural production in Nigeria. The policy implication of this finding is that increase in value of agricultural guarantee loans (VFCLG) will lead to increase in agricultural production in Nigeria hence food security in Nigeria.
(iii) The effectiveness of extension services will lead to increase in staple food production, and agricultural production.

4. CONCLUSION

The conclusion from the study is that staple food production which played a major role in food security is positively and significantly related with gross domestic product of crop production in Nigeria which is also a major and the most important component of agricultural production that guarantees food security in Nigeria. The study also concludes value of agricultural guarantee loans (VFCLG) is positively and significantly related to agricultural production in Nigeria. This shows that Government policy in ensuring food security is effective. This is based on the result Agricultural productivity in Nigeria has been positively and significantly affected by value of agricultural guarantee loans in Nigeria. The study also shows that government has continue to support local food production of the country through deliberate policy to import certain food to make food available to its citizenry and this has contributed to high import bills in the country.

5. RECOMMENDATION

The study after detail analysis of its findings proffers the following recommendations to guide the government on policy formulation. The following recommendations are made for policy and for further study.

(i) Government should enlarge its policy on food security by assisting both individual unit production through incentives on staple food production, and agricultural extension services as this will constitute a major chunk of crop production in Nigeria where rural farmers play a majorrole since Nigeria is still largely based on subsistence production. This will enhance agricultural sector growth of the economy.
(ii) Monetary policy should be designed to bring about increase in value of agricultural guarantee loan as this will continues to funds the sector for the purpose of ensuring food security in Nigeria.
(iii) Government should review its policy on food importation. This is a drain on the nation's resources and export of employment to other nations as the study shows that food import is a major component of nations import. This is because the nation cannot guarantee food security through food import.

(iv) Emphasis should be placed on agricultural extension activities to make the policies on food security (self-sufficiency) come through.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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