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Impact of Ginger Production on Poverty Alleviation in Kaduna State, Nigeria

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Abstract: *The study examines the impact of ginger production on poverty alleviation in Kaduna State, Nigeria. A total of 253 ginger farmers were purposive randomly selected from Kachia, Kagarko and Jaba Local Government Areas of Kaduna State. Primary data were collected using structured questionnaires. Foster, Greer and Thorbecke mathematical model of poverty measurement were used. The result of the study on poverty status revealed that about 74 percent farmers' live above poverty line. This implies that 65 household farmers' with expenditure less than ₦1,120.64 were classified as poor farmers.It was concluded that ginger as the subset of agricultural sector has a significant impact on revenue generation and farmer's income hence reduce poverty. It was recommended that, ginger production should be intensify as part of the root and tuber programme so as to generate more income. There is need for value addition through the development of ginger value chain.*

Keywords: *Ginger, Production, Poverty Alleviation, Kaduna.*

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I. Introduction

Ginger (***ZingiberOfficinale***) is a flowering plant in the family of ***Zingiberaceae***. It is a root crop and a typical herb extensively grown across the world for its pungent aromatic under-ground stem or rhizome which makes it an important export commodity in world trade [1]; [2].

Ginger's origin is not well established though it is generally thought to be a native of Asia, where it was first cultivated. It was also cultivated in the tropical regions of America. Ginger was introduced to Europe by Arab traders from India in the first century AD. The Arabs also took the plant from India to East Africa in the thirteenth century. The Portuguese took it to West Africa and other part of the tropics in the sixteenth century. Ginger was introduced to Nigeria in 1927. The crop is now cultivated in different parts of Nigeria, though the major producing areas include; Kaduna, Nasarawa, Sokoto, Zamfara, AkwaIbom, Oyo, Abia and Lagos States. However, the southern part of Kaduna State is the largest producers of ginger in Nigeria with concentrations in Kachia, Jaba, Jamma'a and Kagarko Local Government Areas (LGAs) [3], [4]. Generally the varieties produced in Nigeria especially in the southern part of Kaduna State are 'TaffinGiwa' and 'YatsunBiri' which are higher in *monoterpene* and oil, giving a more pungent aroma. These species are usually preferred for the production of oils and oleoresins [3].

Ginger is commonly used for different purposes which include treatment of various types of illness like stomach upset, diarrhoea, morning sickness, nausea and vomiting, chemotherapy. Ginger is also used as tea and for making ginger juice. Dry powdered ginger can be used for food flavouring and in food processing industries [5].

Ginger is a high value cash crop that is grown by farmers in many parts of the world. Nigeria is known to be one of the major producers of ginger in the world [2]. Cultivation of ginger began in Nigeria when it was identified as one of the crops that could generate income and promote internal trade. In recent years interest and demand for ginger has increased dramatically worldwide and the crop has assumed great importance in the global market [6]. Ginger production in Kaduna State is one of the basic economic activities that could serve as a source of employment, revenue generation and poverty alleviation.

In an effort by Kaduna State government to reduce the menace of the poverty, Government has embarked on programmes such as National Agricultural Technology Support Programmes, Root and Tuber Expansion Programme, Kaduna State Agricultural Enhancement Programme, New Rice for Africa (NERICA) Project, National Fadama Development Programme (NFDP I, II and III), Community Based Agriculture and Rural Development Projects, National Programme on Food Security (NPFS), Commercial Agricultural Development Project (CADP) [Kaduna State Agricultural Development Programme, [7]. Ginger is one of the crops whose production and expansion is being encouraged in the Root and Tuber Expansion Programme.

Over the years, ginger production in Kaduna State has been in the hands rural farmers most of whom cultivated less than one hectare of land each per year. The desire of the household farmers is for their poverty level to be ameliorated through ginger production. They expect this to manifest in higher income level, better houses, access to improved healthcare facilitiesand better educational facilities to their children.

However, literature on the impact of ginger production in Kaduna State is very scanty. This study therefore attempts to fill the observed gap. It is in this context, therefore that the study intends to examine the contribution of ginger production on poverty alleviation in Kaduna State with specific reference to ginger farmers' access to higher income levels, better houses, improved healthcare facilities and access by their children to better educational facilities.

II. Literature Review

According to the [8] poverty has various manifestations which can be linked to lack of income and assets to attain basic necessities of life, such as food, shelter, clothing and acceptable level of health and education. The manifestation of poverty include the following: living in unstable houses, often made with mud, have no television or radio, are not able to save money, some have children who cannot go to school, or have to leave school prematurely, sometimes lack food for one to two months per year, are unable to harness the natural resources surrounding them and have no wells or access to fresh water.

According to [9] defined the concept of poverty alleviation refers to efforts aimed at reducing the magnitude of "poverty" defined in terms of the proportion of the population living below poverty line. [10]Define the concept of poverty line as the minimum level of income required for living.

[11]Define the concept of Poverty alleviation as the means of improving the living conditions of people who are already poor. Poverty reduction measures are intended to raise and enable the poor to create wealth for themselves as a means for ending poverty forever.

The theoretical framework for this paper is hinged upon the Nurksean concept of vicious cycle of poverty. The concept is discuss hereunder.

2.1 The Nurkes Vicious Cycle of Poverty

The theory of vicious cycle of poverty was put forward by [12]. He describes "vicious cycle of poverty as the basic cause of underdevelopment of poor countries. The Nurksean preposition can be approached from two sides, namely, the supply and demand sides.

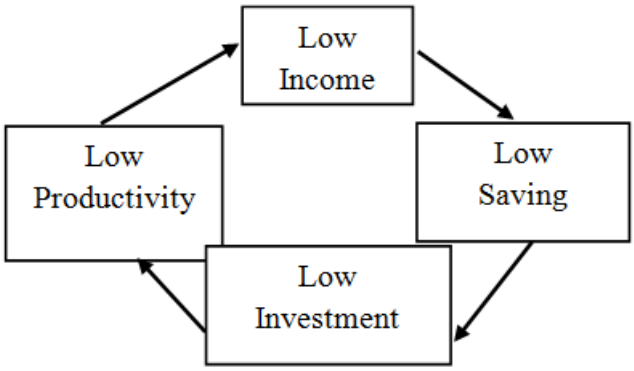

Figure 1: The Supply Side of the Vicious Circle of Poverty.

Source: *Pragyandeepa, (2015) Three major causes of vicious circle of poverty. Retrieved on 15 May, 2016 www.economicsdiscussion.net/povert/3-major-causes-of-vicious-circle-of-poverty-with-diagram/4592.*

On the supply side there is small capacity to save resulting from low income. The low income is the indication of low productivity, which in turn is due to lack of capital. Lack of capital formation is as a result of low saving (figure 1) [13].

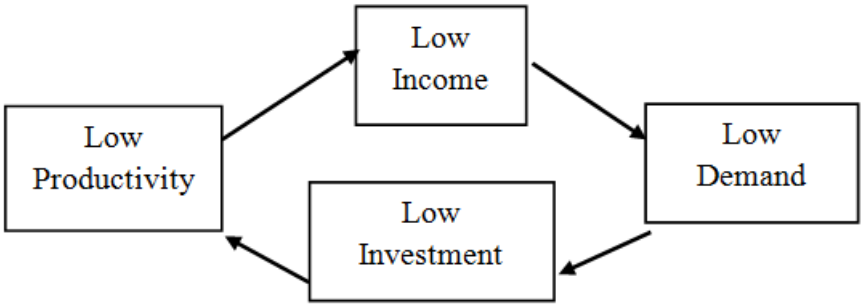

Figure2: The Demand Side of the Vicious Circle of Poverty.
Source: *Pragyandeepa, (2015) Three major causes of vicious circle of poverty. Retrieved on 15 May, 2016 www.economicsdiscussion.net/povert/3-major-causes-of-vicious-circle-of-poverty-with-diagram/4592.*

On the demand side of the vicious circle of poverty Nurkse states that when people have low income the demand for goods is bound to be small. With small size of market, there is no motivation to invest on human capital. When the rate of investment is low, the productivity of the factors of production is bound to be low. Low productivity leads to low per capita income which is quickly absorbed by population growth. The country therefore, remains poor [14]. The theory expresses the circular relationship that affects both the demand and the supply side of the problem of capital formation in economically backward areas.
[15]Summarizes the Nurksean causes of poverty in an underdeveloped country as follows: (1) Inequality of resources ownership, (2) Low productivity (3) differences in access and equity. The poverty according to [15] will continue without pause and the causes will have mutual influence on one another in a circle as demonstrated in Figure 3.

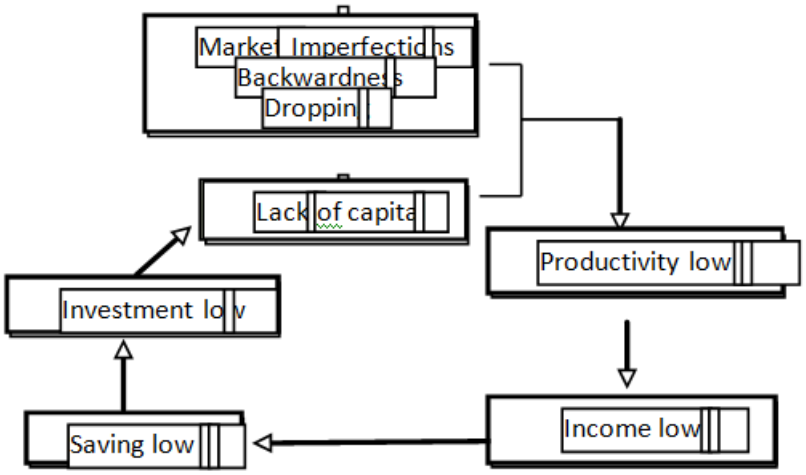

Figure 3: The Vicious Circle of Poverty
Source: *Rohima, S., Suman, A., Manzilati, A. &Ashar, K.(2013). Vicious circle analysis of poverty and entrepreneurship, Journal of Business and Management*, 7(1) 33 – 46.

Market imperfections in underdeveloped countries means that resources are underdeveloped which prevents optimum allocation and utilization of natural resources which, in turn, leads to economic backwardness or "dropping". Low productivity leads to low income, low income lead to low saving, low saving will in turn, lead to low investment, and low investment lead to low capital. This makes vicious circle of poverty difficult to break [15].

[14]Proffers measures that can help in eliminating vicious circle of poverty in developing countries. These include: increased saving, massive investment, enlargement of market, balanced growth, efficient use of natural resources and role of the advanced nations through provision of direct aid in sectors such as health, education and so on, provision of soft loan for development, writing off loans and role of the government through creating incentives to save and investment, root out politics of corruption and bribery, increased agricultural production.

The Nurkse theory of poverty is weak on the ground that, the theory lacks historical cause of poverty. Again, the theory ignores the reality of underdeveloped countries characterized by dependent economies which make it impossible to create massive investment and balanced growth [13].

This theory despite its weakness is relevant to economic development through balanced growth, massive investment and enlargement of market size as the measure to reduce poverty. Balanced growth, in both industrial and agricultural sectors, provides market for the products of each sector and in turn, supplies the raw material for each other.

Deriving from this theory, market size for ginger in Nigeria could be enlarge through value chain addition in order to induce both domestic and foreign investors in ginger production and processing.

III. Empirical Literature Review

[16]Examined the impact of commercial ginger cultivation on economic variables in the Lohit and Lower Dibang Valley Districts of Arunechal Pradesh. They analysed the impact of ginger cultivation on acquisition of consumer durables, construction of building and employment generation. The study used both primary and secondary data from 20 villages and 10 ginger cultivators using random sampling method. The data were analysed using descriptive statistics. The result from the study revealed that commercial ginger cultivation had positive and significant influence on the welfare of ginger farmers through acquisition of consumer durable, construction of buildings and employment generation in the study area.

[17]Studied the impact of small farmers' commercialization of ginger enterprise in Nigeria. The study examined the diversity of small farmers' commercialization of ginger within the selected communities. The study employed community analysis techniques as well as the gross margin analysis, costs and returns analysis. The paper found that there is increased income and improved access to health facilities to ginger farmers as a result of ginger production.

[18]Carried out study on agricultural productivity growth and poverty alleviation. The study examined the impact of agricultural growth on poverty alleviation in the world. The article employed a cross-country estimation of the links between agricultural output per unit area and measure of poverty using regression analysis. The finding revealed that agricultural output was an important determinant of poverty reduction, an increase in the output will lead to reduction in poverty.

[10]Conducted a comparative analysis of gender accessibility to productive resources in ginger production for poverty alleviation in Kaduna State, Nigeria. The study examined the sources and quantities of resources accessed by the ginger farmer for ginger production and the effect of accessibility to resource on the poverty status of the ginger farmers.Simple random sampling techniques were employed to select 250 ginger farmers from Kachia,Kagarko and Jaba Local Government Areas. Primary data were obtained by the use of questionnaire. Descriptive statistics, regression model, Foster, Greer,Thorbecke and logit models were used to analyse the data. The result revealed that women did not have as much access to land as men; the result also revealed that household size, income, membership of cooperative association and access to credit had a significant influence on gender accessibility to land resources. The result further shows that the headcount index of poverty incidence was 40% for the male headed household while it was 68% among the female headed household. The logit result show that accessibility to productive resources has effects on the poverty status of the farmers significantly at $p<0.01$. The study concluded that gender accessibility to productive resources had significant effect on the poverty status of ginger farmers.

[19]Carried out a study on the increasing production efficiency of ginger for poverty alleviation in Kaduna State, Nigeria. The study examined the determinants of farm output in ginger crop farming. The study used multi-stage simple random sampling to collect data from respondents. Cobb-Douglas Stochastic frontier production and cost functions using the maximum likelihood method were employed in analysing their data. The results showed that fertilizer, herbicides and labour were significant in contributing to increase in ginger output and in turn have impacted on the farmer's well-being.

[20]Investigated the effect of socio-economic factors on the adoption of ginger (***ZingibeOfficinale***) production technology in southern part of Kaduna State, Nigeria. The study determined the level of awareness of the production technologies and socio-economic factors on the adoption of ginger production. Both primary and secondary data were used for the study. Simple random sampling techniques were employed. Descriptive statistics and Cobb-Douglas production function techniques were used to analyze the data. The result revealed that education level and scale of farming influenced the adoption of ginger production technologies which increase ginger output thereby reduced poverty. The result further revealed that lack of knowledge on the ginger production package for farmers resulted in low output of ginger.

IV. Methodology

The research adopted survey design. A random sample was conducted to select three hundred (300) respondents with the help of adjusted Taro Yamane formula for calculating sample size [21] from ginger household farmers'. A structured questionnaire reflecting Likert scale was utilized in eliciting responses. Data was analyze using Foster, Greer and Thorbecke mathematical measure of poverty. The researchers embark on visit to the affected establishments and useful observations were made to enhance the success of the research.

4.1 Study Area

The study centered on Kachia, Kagarko and Jaba Local Government Areas of Kaduna State, Nigeria. The Local Government is located in the North - West Geo-political Zone of Nigeria. It falls within the Northern Region. The study area shares boundaries with Kajuru Local Government Area in the North, ZangoKataf Local Government Area in the East, Niger State in the West and with Jemma'a Local Government Area in the South. The selection of the Local Government was based on a prior knowledge that good quality ginger is grown in these areas.

4.2 Sampling Procedure and Sampling Size

A multi-stage sampling technique was used in this study. This includes a purposive random selection of Kachia, Kagarko and Jaba Local Government Areas out of eight Local Government Areas of the southern part of Kaduna State. From the three Local Government Areas, farmers from nine districts were sampled in order to obtain a sample size using the adjusted Taro Yamane formula for calculating the sample size [21]. The formula is:

$$n = \frac{N}{3+N(e)^2}$$

where;
n= Sample size
N= Population
3= Adjusted Constant
e = Confidence level = 0.05

The result of the sampling is shown in Table 1

Table 1: Population and Sample Sizes of Ginger Farmers

LGA's	District	Population of Ginger Farmers	Sample size
Kachia	GidanTagwai	106	32
	Kurmin Musa	110	34
	KurminGwaza	115	35
Kagarko	DogonKurmi	110	34
	Kenyi	100	30
	Kubacha	120	36
Jaba	Kwoi	102	31
	Daddu	120	36
	Ankun	105	32
Total		988	300

Source*: Author's Reconnaissance Survey, 2015.*

4.3 Method of Data Collection

Primary sources of data were used in this study. The data were collected with the help of trained field workers, from ginger farmers through a set of well-structured questionnaire. The questionnaire was designed to generate relevant information necessary to achieve the stated objective.

4.4 Method of Data Analysis

Inferential statistics was used to analyze data.Foster, Greer andThorbecke mathematical measure of poverty was used to examine the impact of ginger production on poverty.To determine the impact of ginger production on poverty in Kaduna State, the mathematical model developed by [22] for poverty measurement found to be useful.

The model is specified as:

$$P_\alpha = \frac{1}{N}\sum_{1-P}^{H}\left[\frac{Y_p - Y_i}{Y_i}\right] \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots .. (1)$$

where:
y_p = poverty line
y_i = average expenditures of respondents household (₦)
H = number of household below the poverty line
α = Foster, Greer and Thorbecke (FGT) Index which takes the values 0, 1, 2.
From the model in equation (1) the following indices or measures could be obtain:

(a) Head Count Ratio: This index measure the proportion of the population that are classified as poor. If alpha value equal to zero (α = 0) from equation (1) the poverty index becomes:

$$P = \frac{H}{N} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$$

(b) Poverty Depth (Gap): This index measure the extent of poverty as it reflects the distance the poor are from the poverty line. If alpha value equal to one (α = 1) from equation (3) the poverty index becomes:

$$P_1 = \frac{1}{N}\sum_{1-P}^{H}\left[\frac{Y_p - Y_i}{Y_i}\right] \quad \text{.....(3)}$$

(c) Severity of Poverty Index: This is the mean of the squared proportion of poverty gap. If alpha value equal to two (α = 2) from equation (1) the poverty index becomes:

$$P_2 = \frac{1}{N}\sum_{1-P}^{H}\left[\frac{Y_p - Y_i}{Y_i}\right]^2 \quad \text{.....(4)}$$

V. Results And Discussion

5.1 Impact of Ginger Production on Poverty in Kaduna State

Data was collected on monthly consumption expenditure of household farmers were calculated using Foster-Greer-Thorbecke (FGR) mathematical poverty measurement. The summary of the result is shown in Table 2.

Table 2: Foster-Greer-Thorbecke (FGT) Poverty Measures for the Ginger Farmers

TEPHE	**MHE**	**PL**	**TEP**	**AEP**	**HCR** P_0	**PGR**	**PD** P_1	**PS** P_2
I	**II**	**III**	**IV**	**V**	**VI**	**VII**	**VIII**	**IX**
850,564.86	3,361.91	1,120.64	34,783.45	535.13	0.26	0.52	0.14	0.07

Source: Author's Computation, (2016)

Key to the table:

Where TEPHE= Total expenditure per household equivalent, MHE = mean household equivalent, PL = Poverty Line, TEP = total expenditure of the poor, AEP = Average Expenditure of the poor, HCR = Head Count Ratio, PGR = Poverty gap ratio, PD = poverty Depth and PS = Poverty Severity.

In estimating the poverty indices, this study measured the wellbeing of the household farmers by their total consumption-expenditure using the adult equivalent scale. Having established the individual member of the household consumption expenditure, one-third ($^1/_3$) of the mean consumption expenditure of the whole sample under study was used to establish poverty line at ₦1,120.64 per month adult equivalent as shown in Table 3 above. The result of poverty measures indicated in Table 2 reveals that only 26% of the farmer's household out of the 253 sample farmers were classified to be living below the poverty line, while 74 percent of household farmers were above the poverty line. The poverty head count, depth and severity were, 0.26, 0.14 and 0.070 percent respectively. This means that 26 percent of the sample farmer's lived below the poverty line of ₦1, 120.64 per month, while 14 percent of the expenditure is required to bring households farmers that are poor up to the poverty line. The poorest household accounted for 7 percent of the households.

This finding was in close range with that gotten by [23] that the poverty line was ₦1,406.20 per month in Giwa Local Government of Kaduna State. However, the percentage of the poor gotten in this study (26 percent) is quite low when compared with that gotten by [23] that is 34 percent. Similarly, the result was quite low compared to the finding of [24] on Status of poverty in GebiResu Pastoralists area Ethiopia. Their result revealed that incidence; depth and severity of poverty were found to be 44.6 percent, 11.9 percent and 4.14 percent respectively. The result further revealed that income obtain as the result of ginger production had further enhanced consumption expenditure of the household farmers in the study area. The low manifestation of incidence, depth and severity of poverty in the study area could be probably due to the contribution of ginger production to the household farmers' income in Kaduna State. The three measures of poverty shows that the rate of poverty amongst the ginger farmer's in the study area is relatively low.

VI. Conclusion And Recommendation

It can be concluded that ginger production has increased the income of farmers and thus impacted on social wellbeing of the farmers thereby reducing poverty level of the farmers in the study area.It was recommended that:

(1) Ginger production should be intensify as part of the root and tuberprogramme so as to generate more income for farmers' and create more employment for the youth that would help in improving their social wellbeing.
(2) There is need to make farming attractive to people especially the youth, in other to reduce unemployment.
(3) There is need to enhance security throughout the State so as to inject confidence among the farmers and those engage in various aspect of ginger activities such as suppliers of the input, buyers and processors of the product.

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APPENDIX XI

Foster, Greer and Thorbeck Mathematical Measure of Poverty

Total expenditure per household equivalent = ₦850, 564.86

Mean expenditure = $\frac{₦850,564.86}{253}$

= ₦3, 361.91

ME = ₦3, 361.91

Poverty line = $^1/_3$(ME)

= $^1/_3$(₦3, 361.91)

Poverty line = ₦1, 120.64

Total expenditure of poor = ₦34, 783.45

Average expenditure of poor = $\frac{₦34,783.45}{65}$

Headcount ratio = ₦535.13

$= \frac{65}{253}$

$= 0.2569$

$\cong 0.26$

$= 26\%$

Poverty gap ratio = $\frac{Y_P - Y_1}{Y_P}$

$= \frac{₦1,120.64 - ₦535.13}{₦1,120.64}$

$= \frac{₦585.51}{₦1,120.64}$

PGR = 0.52

Poverty Depth = HCR X PGR

= 0.26 X 0.52

= 0.1358

≅ 0.14

= 14%

Poverty Severity = HCR X $(PGR)^2$

= 0.26 X $(0.52)^2$

= 0.07

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