The Effects Of Rural Infrastructure Development On Crop Farmer'S Productivity In Osun State.

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Abstract: The study was carried out to ascertain level of infrastructure development in Osun state, with data obtained from Primary source. Multistage random sampling procedure was adopted with the selection of 100 farmers from 10 villages in three local government areas selected from the three senatorial districts in Osun state. The results of infrastructure index shows that Olorunda local government is the most developed with index of 0.45, followed by Ayedaade (0.88). Ife central is underdeveloped having an index of 1.65. Gross margin (economic productivity) analysis also reveals farmers in Olorunda having the highest (N116480), followed by Ayedaade (N103400.4) and Ife central (N64048.29). Paired t-test analysis shows significant difference between the gross margins of farmers in Olorunda and Ife central; and Ayedaade and Ife central. The result of production frontier model reveals fertilizer, farm size and distance to major roads as the major determinants of farmers' productivity.
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Background

The rural areas of Nigeria are inhabited by the bulk of the nation's population; they serve as the base for the production of fibre and raw materials for industries. They are also the major sources of capital formation for the country, and a principal market for domestic manufactures (Olatunbosun, 1975). In general terms, the rural areas engage in primary activities that form the Foundation for any economic development (Olayiwola and Adeleye, 2005). Despite this role, rural areas have been unattractive to live in due to the dearth of infrastructures, which are key to agricultural and economic development.

Agricultural development is essential for economic growth, rural development, and poverty alleviation in low-income developing countries. Productivity increase in agriculture is an effective driver of economic growth and poverty reduction both within and outside agricultural sectors. Such productivity increase depends on good rural infrastructures, well functioning domestic markets, appropriate institutions, and access to appropriate technology. While the state of rural infrastructure varies widely among developing countries, most lower-income developing countries including Nigeria suffer severe rural infrastructure deficiencies. Deficiencies in transportation, energy, telecommunication, and related infrastructure translate into poorly functioning domestic markets with little spatial and temporal integration, low price transmission, and weak international competitiveness (Per Pinstrup and Satoru, 2006).

Attempts at solving the rural problems in Nigeria had been the concern of the governments over the years, with the implementation of agricultural programmes such as Operation Feed the Nation (OFN); the National Accelerated Food Production Programme (NAFPP) and the Directorate for Food, Roads and Rural Infrastructure (DFRRI) with the aim of improving the quality of rural life. World Bank (1995) and Ekong (2003) attested that the spread of needed infrastructures and introduction of appropriate technology in rural areas would improve rural agriculture and industrial output. Idachaba (1981) was also of the opinion that infrastructural facilities constitute a major substance of rural welfare and the provision of such facilities constitutes a major procedure for development of rural communities. According to Ekong (1988) rural infrastructure are physical facilities that enhance rural dwellers' production, distribution and consumption activities and ultimately improve the quality of their lives. These physical facilities are roads (Uwasi and Obasi, 2010), markets, post offices, boreholes, health centre, schools, irrigation facilities and recreational facilities.

Problem Statements

The role of infrastructure is complex and its effects are indirect. Consequently development economists have not focused on infrastructure as much as they have on directly productive activities such as agriculture and industry.

It has also been established that infrastructure imparts welfare in three basic respects: such affects utility derivable from existing and budgeted income. Second, its availability affects productivity and capacity to earn income. Thirds it affects households and national stock real wealth in the rural and urban

economies. Availability of infrastructure affects people's (poor and the rich) time allocation (Idachaba, 1978; 1994). Infrastructure also has multiple effects on health and quality of life. (Kessides, 1993 and Alaba, 2001) pointed out that individuals are poor because they do not have access to infrastructure services of necessary quality. FAO (1996) stated that infrastructure though are key stimulants to agricultural development and growth, they are limited in all rural areas. Several studies (Fan, Hazell and Thorat2000; Mundlak et al, 2002; Fan and Zhang, 2004) have also revealed that investment in infrastructure is essential to increase farmers' access to input and output markets, stimulation of rural non-farm economy and vitalize rural towns. It also increases consumers' demand in rural areas and facilitate the integration of less favoured rural areas into national and international economies.

In many communities in Nigeria, inadequate or low quality infrastructure has been known to have serious implication for welfare and persistence of poverty.

Gains from agriculture, forestry and off-farm income-generating activities cannot be achieved or sustained in the absence of basic and appropriate rural infrastructure, which ranges from roads, communication, electricity and energy to education, health and sanitation facilities to access to safe drinking water. While the importance to agricultural and rural development of establishing adequate road networks is widely recognized, governments have often allocated the preponderant share of their transport budgets to prestige projects, while skimping on secondary and farm-to-market roads in agricultural areas and their maintenance, both of which generally have much more favourable cost-benefit ratios.

Also over two billion people, most of them in rural areas, have no access to safe drinking water and sanitation. It is no wonder that poor rural people consider safe and affordable drinking water a top priority and lack of access to it a serious constraint to productivity. Leaving aside health reasons, constructing and maintaining wells near villages could save many women and school-age girls as much as two to three hours per day in time spent fetching water (IFAD, 2005).

A number of policy recommendations towards infrastructure development have been made in the past. One of these is the adoption of national rural basic need programmes, which consist of rural welfare base line, and identification of appropriate rural development strategies, programmes and projects. Others are establishment of Directorate of Food, Road and Rural Infrastructure (DFRRI), River Basin Development Authorities (RBDA), Nigerian Building and Road Research Institute (NBRRI) as well as Rural Water Supply and Sanitation Programme (RWATSAN). The most recent is the Fadama project that is expected to help in improving productive capacity of rural farmers through provision of farm assets and rural infrastructures.

Realizing the important role infrastructure would play in the development of Nigerian agriculture, government efforts over the years have been put into opening up the land and linking rural communities with the cities. Public utilities are also being gradually but steadily brought to the rural population. Rural electrification, water and roads have been national priorities for nearly a decade and half. All these are in the effort to improve the infrastructure base of the rural Nigeria. The extent to which these have helped in increasing the productivity of rural farmers is a major area for research, which is the main focus of this study.

Objectives of the Study

The main objective of this study is to study the effect of rural infrastructure on the production (output) of some arable crops farmers in Osun State, the specific objectives are to:

Determine the extent of rural infrastructure development in the selected local government areas.

Determine the impact of rural infrastructure on crop farmers' output.

Examine and compare the profitability (economic productivity) of farmers in infrastructural developed and less developed local government(s).

Justification of the Study

In the course of conducting research on food policies and agriculture in general, it has increasingly been recognized that development of infrastructure, particularly rural infrastructure, bears enormous implications for policy outcome (IFPRI, 1992). Rural infrastructure is often an underlying critical factor impinging on policy outcomes in such research areas as liberalization of output and input market, diversification of agriculture, macro policy reforms, financial market development, natural resource management, poverty alleviation through employment and various other public policies (World Bank, 1994).

Economists have long been working to discover why some countries move fast while others lag behind on the path of economic development. The role of infrastructure facilities in economic development either remains to be fully unfolded or has been unraveled with considerable degree of ambiguity.

Furthermore, comprehensive review of the literature on infrastructure (Whittington et al 1990, Ahmad and Donovan, 1992, Akin et al 1995) demonstrates that there is a glaring gap in methods for measuring the effects of infrastructure. Most empirical studies are concerned with measurement of the impact

of a discrete element rather than a composite group consisting of a number of infrastructure elements. Some researchers have used econometric techniques to measure the effect of road development, electrification and institutional development on agricultural production and economic growth (Binswanger, et al 1989; Antles, 1983; Barnes et al, 1986 and Beenhakker and Hertel, 1989). Most of these empirical studies are based on inter country or inter district cross – section time series analyses. For example the study by Binswanger et al (1989) analysed the contribution of output price, fertilizer price, wage rates, irrigation, education, electricity, road, markets, and environmental factors to the growth of agricultural output in India, using district level measures of variable. They found the contribution of the infrastructure variables to be very high; combined effects of these variables were almost 2.5 times greater than the contribution of irrigation.

The problem with this type of analysis is the unreliability of estimates of the contribution of individual infrastructure. More over, district data are always questionable for this type of analysis. (Ahmed and Hossain 1990). Umeh, (1984) in his study on the impact of rural infrastructures in the Ayangba and Lafia Agricultural Development Projects focused mainly on how the projects' three basic service packages (Rural roads, Service center, and Extension service) affected the crop family activities in the project areas

From the foregoing, studies have shown that theoretical application of the role of infrastructure in economic development is found, but empirical validation of these theoretical works is extremely few. Furthermore, majority of the work on impact of rural infrastructure on agricultural productivity does not holistically capture most of the infrastructure elements. Therefore, the need to localize, update and capture more infrastructure facilities by evaluating the effects on productivity of farmers in Nigeria and particularly in Osun state becomes imperative in the context of inadequate, dilapidating infrastructure facilities coupled with inconsistent policies towards the development of such facilities.

Furthermore, the study will provide current, accurate and reliable information on the states of infrastructure facilities i.e. availability, appropriateness and adequacy which could be useful in planning successful and suitable rural infrastructure development policy in Osun State with the ultimate aim of improving Nigeria, farmers' productivity.

Materials and Methods

Study area

The study area is Osun State, Nigeria. It covers an area of approximately 14, 875 square kilometers. It is bounded by Ogun, Kwara, Oyo, Ondo and Ekiti State in South, North, West and east respectively. The state lies within the tropical rainforest. The 2006 national population and housing census exercise put the population of the state at 3,423,535.

The three senatorial districts are Osun West, Osun East and Osun Central. Like other states in the southwestern region of Nigeria, Osun State experiences two seasons the dry harmattan and the wet rainy seasons. The climate of the state favours the growth of a variety of food and cash crops. The crops grown in the state either as sole crops and/or mixed crops include: yam maize, cassava, cowpea sorghum, soybean, okra pepper, guinea corn, melon and rice while cash crops include cocoa and oil palm.

Data Collection and Sampling Procedure

The data collected was from primary and secondary sources. The primary data were collected with the aid of well-structured questionnaire, containing information such as the socio economic characteristics, output and income levels of farmers, also information used in ranking local governments according to their level of infrastructure development. This information includes distance and transportation cost to the nearest infrastructure. The infrastructures considered are school, market, health centers, potable water, credit centers, agroservice center and extension service center.

A multi stage sampling procedure was adopted for the study. The first stage involves random selection of one local government from each of the 3 senatorial districts in Osun state: namely; Olorunda, Ayedaade and Ife central local governments from Osun Central, Osun West and Osun East senatorial districts respectively.

The second stage involves random selection of villages from the three local governments. Three villages were selected each from Ife central (Abagboro, Oke-ake, Ifa-Olewa) and Olorunda local governments (Agunbelewo, Oba-oke, Ota-Efun). Four villages were however selected from Ayedaade (Seriki, orile-owu, Morore, Araromi) this is due to the presence of more farming households compared to the other two local governments.

Random selection of 10 farming households from each of the selected villages constitutes the third stage, giving a total number of 100 respondents, table 1.

However, out of the 100 questionnaires administered, 98 were correctly filled and returned and these were used for the analysis.

Table1: Summary of Selection Procedure

Senatorial districts	Local governments selected	No. of villages	Name of villages	No. of respondents
Osun West	Ayedaade	4	Orile Owu, Morore, Seriki Araromi Owu	40
Osun East	Ife-central	3	Ifaolewa, Abagboro ,Oke Ake	30
Osun Central	Olorunda	3	Oba-Oke, Agunbelewo, Ota-Efun	30

Method of Data Analysis

Descriptive statistics such as frequency distribution/percentages, mean, mode etc were used to analyse the socio-economic characteristics of the faming households.

Composite Measure of Infrastructure Development (infrastructures index)

The information used in calculating the infrastructure index includes distances and costs from the village to the nearest elements of infrastructure. These elements are roads, heath dispensary, market, potable water source, schools, extension offices station, credit society and agroservice center

A total cost of infrastructure availability (TC) was computed by summing the average costs (ACi) of getting to a particular infrastructure facility in the 10 villages. ACi was however obtained as an average individual transportation cost (IDCi) of the respondents in each of the 10 villages. The use of transportation cost was based on fact that an interaction exists between transportation facilities and institutional infrastructures, Ahmed and Hossain (1990).

An Average Total Cost (ATC) of getting to each of the infrastructure elements across the villages was obtained by dividing the total cost (TC) by the total number of village (N). ACi was finally weighted with ATC to obtain the weight Wi for each infrastructure and across the entire village.

The infrastructure index (I) was finally obtained by finding the average of the Wis of the infrastructure facilities for each of the local governments.

Algebraically

$$ACi = \frac{\sum_{i=1}^{n} IDci}{n}$$

$$TC = \sum_{i=1}^{n} ACi$$

$$ATC = \frac{TC}{N}$$

$$Wi = \frac{ACi}{ATC}$$

Where

IDci = individual transportation cost of getting to each infrastructure by the respondents in each village

ACi = Average cost of transportation in each village

TC = Total cost of transportation to a particular infrastructure across villages

ATC = Average total cost of transportation across villages

INF = Infrastructure index

N = total number of villages

n = Number of respondents in each village

The infrastructural index (INF) indicates the degree of underdevelopment, thus, the higher the value of infrastructural index, the less developed the village is considered. The villages in each local government selected were pulled together and infrastructural index (INF) was calculated on local government level. The higher the value of INF obtained for any local government, the less developed the local government. Further, approach to grouping the local governments into developed and underdeveloped areas was to sum up the infrastructural index for all the local governments and obtained average. The local governments with value above the average were said to be underdeveloped and those below average were regarded as being developed. This procedure of measuring the degree of infrastructure development follows that adopted by Ahmed and Hossain (1990).

Production Function Analysis:

This was used to assess the impact of infrastructure on output of crop farmers. Its parameters were estimated by the method of maximum likelihood.

The method considers frontier production as a parametric function of the input.

Conversion factor was used to convert the crops produced by farmers in the study area to their grain equivalent. The major crops in the study are maize, cassava, yam and vegetables and their respective conversion factor are 1.00, 0.30, 0.25 and 0.06.

Ajibefun and Daramola (2003) represented the production function as:

$Qi = f(Xi,\beta) + Vi-Ui$……. Equation 1

Where Qi= output of the ith farm

Xi = Vectors of inputs

B = Vector of parameters to be estimated

Vi = The symmetrical disturbance which captures the random error effects on output.

Ui = the asymmetric error component

The value of output (Q) was estimated thus;

$Q_1 = f(x_1, x_2, x_3, x_4, x_5, x_6, x_7, x_8, x_9, x_{10}, x_{11}, x_{12})$

$1nQ = lnbo + b_1lnx_1 \ldots\ldots\ldots + b_{12}lnx_{12} + (\Delta_1 + \ldots\Delta_3) + e$

Q_1 = Output (Q) (grain equivalent)

x_1 = Farm size in hectares

x_2 = Family labour (in mandays)

x_3 = Number of children (mandays)

x_4 = Fertilizer (kilograms)

x_5 = Distance to major roads(kilometers)

x_6 = Distance to market infrastructure (kilometers)

x_7 = Distance to health infrastructure (kilometers)

x_8 = Distance to school infrastructure (kilometers)

x_9 = Distance to extension infrastructure (kilometers)

x_{10} = Distance to potable water (kilometers)

x_{11} = Distance to credit infrastructure (kilometers)

x_{12} = Distance to agroservice centre infrastructure (kilometers)

Where Δ_1 …. Δ_3 are efficiency variables

Δ_1 = Age (years)

Δ_2 = Sex

Δ_3 = Religion

bo = constant term

e = Stochastic error term

$b_1 – b_{12}$ = coefficients of production variables

3.5.3 Gross Margin Analysis

The **gross margin** analysis (economic productivity) was used to compare the profitability of farmers in infrastructurally developed and undeveloped local governments.

Gross margin = Total revenue - total variable cost

GM = TVP – TVC

TVP = Total value of produce

TVC = Total variable cost

Paired t-test was also used to determine if there is significant difference between the average gross margins of the three local governments in the study area.

Results and Discussion

As shown in table 2, the study reveals that majority of the respondents are male (77 percent), while 49.7% is within the age range of 40-49 years, with the mean age of the respondents being 43.7 years. This indicates that majority of the farmers are in their active and productive age. The study also reveals that 93.9 percent of the farmers are married with more than half having no formal education, indicating low literacy level in the study area. About two-third of the farmers in the area are Muslims.52.1 percent also have between 5-8 numbers of children with the mean being five. This is an indication that farmers in the study area have relatively high household size probably due to the perceived labour intensive nature of farming.

A larger population of the respondents (63.3 percent) cultivated 2ha and above while 36.7 percent cultivated between 0.2-1.9 hectares. 55.3 percent of the farmers produced output (consisting of sole or combination of maize, cassava, yam, cowpea and vegetables) between 3000 and 9220.00 while 44.7 percent of the farmers' produces 835 -2999 of output (grain equivalent). Based on income range, 51.2 percent of the respondents are within N111, 000 and 149,999. The mean income is however N125753.

Table 2: Socioeconomic Characteristics of Crop Farmers.

Age	**Frequency**	**Percentage**
20-29	6	6.3
30-39	21	21.4
40-49	47	47.9
50-59	19	19.3
60-69	5	5.1
Total	98	100
Mean	43.7041	
Standard Deviation	7.909	
Marital status	**Frequency**	**Percentage**
Single	2	2.0
Married	92	93.9
Widowed	3	3.1
Divorced	1	1.0
Total	98	100
Educational level	**Frequency**	**Percentage**
No formal education	55	56.1
Primary	21	21.5
Secondary	20	20.4
Tertiary	2	2.0
Total	98	100
Sex	**Frequency**	**Percentage**
Female	21	21.4
Male	77	78.6
Total	98	100
Religion	**Frequency**	**Percentage**
Christianity	35	35.7
Islam	63	64.3
Total	98	100
Number of Children	**Frequency**	**Percentage**
1-4	39	39.8
5-8	51	52.1
9 and above	8	8.1
Total	98	100
Mean	5.13	
Standard Deviation	2.50	
Farm Size (hectares)	**Frequency**	**Percentage**
0.2-0.90	9	9.2
1.00-1.90	27	27.5
2.00-2.90	29	29.6
3.00-3.90	19	19.4
4 and above	14	14.3
Total	98	100
Mean	2.48	
Standard Deviation	1.412	
Output (grain equivalent)	**Frequency**	**Percentage**
835-1999	21	21.1
2000-2999	23	23.6
3000-3999	28	28.3
4000-4999	15	15.5
5000 -9220	11	11.5
Total	98	100
Mean	3308.2041	

Standard Deviation	1622.2378	
Income (Naira)	**Frequency**	**Percentage**
20000-49,999.00	9	9.2
50,000-79,999.00	22	22.03
80,000-110,000	16	16.4
111,000-149,999	24	24.5
150,000 -557800.00	27	27.6
Total	98	100
Mean	125753.1	
Standard Deviation	78959.55	

Index of Development (Infrastructure Index)

Infrastructure index was computed to have an understanding of the degree of development of the three local governments considered (table 3). Infrastructure Index was generated by considering the distance from the villages in each local government to each of the infrastructures considered. The average distance of the villages to each infrastructure element in each of the three local governments in the study area were used to compute the infrastructure index on local government basis.

As shown in table 3, Olorunda Local Government Area (LGA) from Oshogbo senatorial district is the most developed with infrastructure index of 0.45; this is followed by Ayedaade local government from Osun west senatorial district with an index of 0.889. Ife-central local government from the East is however the least developed, having an index of 1.658, which is above the average index value of 1.00

Table 3: Degree of Infrastructure Development

Infrastructure	**Weight of average transpiration cost (wt)**		
	Olorunda (wt)	**Ife central (wt)**	**Ayedaade (wt)**
Health	0.39003	2.2900	0.3196
School	0.5902	1.3769	1.0329
Market	0.2820	2.0725	0.6454
	0.3985	1.4336	1.1679
Extension	0.6491	1.5143	0.8366
Potable water	0.4072	1.4105	1.1824
Credit	0.5156	1.4581	1.0264
Agro service	0.3808	1.7105	0.9087
Road			
Sum	3.6137	13.2663	7.1199
Infrastructure index	0.452	1.6583	0.8899
Status	Most developed	Under-developed	Developed
Mean Infrastructure value	1.00		

Table 4 shows and compares profitability analysis (economic productivity) of farmers' output in the study area. The respective Average gross margin was N116480.8, N103400.4 and N64058.29 for the most developed (Olorunda), moderately developed (Ayedaade) and under-developed (Ife-central) local government areas.

This result, therefore, shows a higher return on output in the developed local governments, which could be attributed to the presence of more infrastructural facilities in the developed local governments compared to the least developed one.

Table 4: Gross Margin Analysis

Local Government Area	**Infrastructure status**	**Average Gross Margin**
Olorunda	Most developed	N 116480.8
Ayedaade	Moderately developed	N 103400.4
Ife central	Under developed	N 64058.29

The difference in the gross margin (economic productivity) of the farmers in the local governments was established with the use of paired t-test as revealed in table 5. The test shows no significant difference between the gross margins of farmers in Olorunda and Ayedaade, which could most likely be due to the fact that both local government areas are developed.

The results further show significant difference between gross margins of farmers in Olorunda and Ife central; and Ayedaade and Ife central at one percent level. The significant difference between Ife-central and the other 2 local governments may be however be attributed to the poor state of infrastructure in Ife central as it is clearly shown in the infrastructure index.

Table 5: Paired Sample Test between Average Gross Margin of the farmers in the local governments

Local governments	Mean	Std. deviation	T	df	Sig (2-tailed)
Pair 1 Olorunda-Ayedaade	17027.974	81437.01542	1.145	29	.261
Pair 2 Oorunda-Ife-central	52422500	78316.03323	3.666	29	.001
Pair 3 Ife-central-Ayedaade	-35394.53	67841.34154	-2.858	29	.008

As shown in table 6, three variables are the major factors affecting farmers' productivity in the study area. These variables are farm size and distance to major roads, significant at one percent level, while family labour is significant at 5 percent.

The positive beta coefficients of farm size and quantity of fertilizer indicate that as these two variables increase, farmers output also increases. This is expected as larger farm size with corresponding increase in fertilizer quantity tends to increase the productivity of farmers. There is however an inverse relationship between distance to major roads and farmers output. This indicates that increase distance to major roads tends to reduce the output of farmers. This may be as a result of high transportation cost incurred by farmers in moving their produce from the villages to the major roads and market, which tends to reduce their income and consequently their output. This is in conformity with the findings of Idachaba (1978) that rural roads constitute, perhaps, the most important infrastructure in the structural transformation of Nigerian agriculture.

Results of technical efficiency reveal that the crop farmers in the study area are 83.63 percent efficient. Though, none of the efficient variables is significant, all (age, sex, religion and marital status) are directly related to farmers' technical efficiency.

Table 6: Results of Production Frontier Analysis

Variable	Coefficient	Standard error	T static	Probability
Constant	7.388	1.2483	5.918	0.0000
Farm size (hectare)	0.5738	1.2483	7.748*	0.000
Family labour (mandays)	0.1854	0.7406	0.486	0.6267
Number of children	0.4231	03811	0.855	0.3923
Fertilizer (kilograms)	0.1507	0.4945	2.340**	0.0193
Distance to major roads (kilometers)	-0.8973	0.6441	-4.109*	0.000
Distance to market (kilometers)	0.3919	0.2184	0.197	0.8439
Distance to health (kilometers)	0.3031	0.1991	0.486	0.6267
Distance to school (kilometers)	-0.8758	0.1811	-0.299	0.7650
Distance to extension (kilometers)	0.9074	0.2928	0.770	0.4416
Distance to potable water (kilometers)	-0.1895	0.2041	-0.928	0.3532
Distance to credit (kilometers)	0.2024	0.1898	1.066	0.2864
Distance to agro service centre (kilometers)	0.2525	0.1286	0.196	0.8444
Log likelihood value	8.47820			

The figures with *, **, are significant at 1%, and 5% respectively.

Efficiency variables

Variable	Coefficient	Standard error	t-ratio	Probability
Constant	3.6759	2.7309685	1.346	0.1816
Age	0.3459	0.4635	0.746	0.4574
Sex	-0.4889	0.9609	0.509	0.6121
Religion	0.4436	0.7376	0.601	0.5490
Marital Status	1.6609	1.9597	0.848	0.3989
Mean efficiency (γ)	83.63 percent			

Summary of Major Findings

This study was carried out to investigate the effect of rural infrastructure on farmers' productivity in Osun State, Nigeria with specific reference to arable crop farmers. Specifically, the study analyzed the socio-economic characteristics of farmers, infrastructural developments of selected local governments, gross margin of sampled crop farmers and the effects of socio economics characteristics and infrastructural variables on farmers' output. A total number of 10 villages were sampled from the 3 selected local government areas across the 3 senatorial districts in the state.

The study reveals that majority of the respondents are male (77 percent), while 49.7% is within the age range of 40-49 years, with the mean age of the respondents being 43.7 years. 93.9 percent of the farmers are also married with more than half having no formal education. About two-third of the farmers in the area are Muslims.52.1 percent also have between 5-8 numbers of children with the mean being five.

A larger population of the respondents (63.3 percent) cultivated 2ha and above, the mean hecterage being 2.48. 55.3 percent of the farmers produced output between 3000 and 9220.00 kilograms .The income range also shows that 51.2 percent of the respondents are within N111, 000 and 149,999. The mean income is however N125753.

Computed infrastructure index based on local government areas (LGAs) selected shows that Olorunda from Osun central (Oshogbo) with infrastructural index 0.451 is the most developed followed by Ayedaade LGA (0.889) from Osun West senatorial district. Ife central from Osun East senatorial district is however underdeveloped with index of 1.658 which is above the average infrastructure index of 1.00. Gross Margin Analysis shows that Olorunda LGA has the highest average gross margin of N116480.8 being the most developed followed by Ayedaade LGA (N103400.4), while Ife central LGA has the lowest gross margin of N6458.27.

The result of paired T-test shows no significant difference between the gross margins of farmers from the two developed local governments. There is however significant difference between the gross margins of Ife central and Ayedaade; and Olorunda and Ife Central. The significantly low gross margin value of farmers in Ife-Central could be attributed to poor state of infrastructure, which need to be developed. Results of frontier production functions show that; farm size, fertilizer and distance to major roads significantly affect farmers' output. Road being the only significant variable among other infrastructures however serve as a major means of accessing other infrastructures as it is essential to enhance farmers' access to input and output markets.

Conclusion

In this study, the main objective is to determine the effect of rural infrastructures on the production (output) of farmers. The main focus of this study is the state of rural infrastructures as related to agricultural productivity of farmers. For Nigeria to combat food crisis and food insecurity and rural urban migration, policies targeted towards rural infrastructural development most especially rural roads should be formulated because bulk of farm produce still comes from the rural areas.

The role of infrastructural facilities in grassroots development and poverty reduction cannot be over-emphasised in rural environments.

(McNeil, 1993; cited in Shittu, 2007) show that adequate infrastructure reduces (especially rural roads, which ease the transportation of agricultural produce from the farm to the market) the costs of production, which affects profitability, levels of output, and employment. When infrastructure works, productivity and labour increase translating to creation of employment opportunities and better welfare for the rural populace. However, when it does not, citizens suffer particularly the poor. Thus, economic renewal and societal welfare become postponed or halted.

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