

## EFFECT OF ROAD INFRASTRUCTURE ON FARM PRODUCTION IN OYO STATE, NIGERIA

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### Abstract

*In spite of the fact that majority of Nigerian farmers live in rural areas, the rate of infrastructural development in the rural areas remain a source of serious concern. This study was therefore carried out to assess the state of road infrastructure and its effect on farmers' productivity in Oyo state, Nigeria. A three stage random sampling technique was employed to select 120 farming households in the study area. Descriptive statistics and the multiple regression models were the major analytical tools employed for the study. The result of the analysis showed that the state of road infrastructure in the study area is less than stellar as only about 12 percent of the roads were tarred. Cost of inputs, farm size, access to fertilizer, labour and access to good roads were identified as the significant factors influencing farmers' output in the study area. In line with the results of the study, it was recommended that the government should focus on construction of more rural roads to enhance farmers' productivity and income through increased access to inputs and product market.*

**Key words:** Infrastructure, Market, Road, Rural, Oyo

### Introduction

Majority of farmers in Nigeria live in rural areas where basic infrastructures are lacking: Rural infrastructure comprising of rural roads, market, irrigation systems, water supply, telecommunication facilities, health and educational facilities are basic to quality of life in rural areas and are important facilitators of economic growth and development (PCU-NFDO, 2005; Ahmed and Donovan, 1992). Rural infrastructure is defined to include those underlying or basic physical, social and institutional forms of capital which enhance rural dwellers production, distribution and consumption activities and ultimately the quality of their life (Ekong, 1988, Idachaba, 1978). Rural infrastructure is crucial for agriculture, agro-industries and overall economic development of rural areas. Investment in rural infrastructure has the tendency to bring about the needed phenomenal growth in agricultural production and productivity in rural areas trickle down economic benefits to the rural poor (Fan *et al.*, 2000; Binswanger *et al.*, 1993). Developing countries including Nigeria have not invested adequately in rural areas to boost agricultural production, improve rural income and the quality of life as well as to stem rural –urban drift.

According to Idachaba (1985), rural infrastructures constitute the substance of rural welfare; which is the improvement of the socio-economic life of a community. Infrastructural development goes with development programmes such as agricultural extension, mass education, health and nutrition extension or any of the terms applied to sectoral programmes within rural community. Provision of rural infrastructure and services such as Roads, Health centres, markets and electricity in the rural areas could help in the achievement of an increased rural production and consequently increase rural agricultural and industrial output (World Bank 1997).

According to Fakayode *et al.* (2008) poor access to infrastructural facilities like good roads, health centers, educational facilities or institutions, communication gadgets and water supply all leads to a low agricultural production. Lack of good feeder roads directly influences the degree of rural poverty by limiting the scope of agricultural production, sale and keeping member of the rural communities relatively isolated. Rural physical infrastructures among which are transportation facilities (federal, state and L.G.A roads, railways, bridges, ferry services, canal ports and foot paths) constitute, perhaps, the most important infrastructure in the structural transformation of Nigerian agriculture. Tracey-

White (2005) noted that mobility in rural areas could be hampered by the lack of transportation facilities and unavailability of good roads which could have a negative effect on farmers' productivity.

In spite of the fact that road infrastructure is an important factor in integrating the rural ties into the overall national development process its development in many communities in Nigeria has not been taken seriously. This is because it is either taken for granted or it is difficult to quantify its direct and indirect effects. The physical condition of most of the existing earth or tarred road in rural areas especially during the rainy season is quit bewildering. During the rainy season, the roads become almost impassable. The poor state of the roads apart from having undesirable effects on passengers; goods and traffic flow, also results in substantial loss of perishable agricultural produce, high cost of moving agricultural produce and other products and exorbitant cost of vehicle maintenance. All these culminate in high cost of transport, agricultural inputs, marketing inefficiency and high cost of food stuffs and other products derived from rural areas (Ogunsanya, 1987).

The need for road infrastructure arises from the fact that there is a greater need for accessibility to inputs, equipments and new technologies by farmers. Also smooth movement of abundant agricultural products especially from the rural areas, to the markets in urban centers is imperative. Since no research has been carried out to examine the effect of road infrastructure on agricultural productivity in the study area, this study seeks to describe the nature of road infrastructure and to analyse the effect of such infrastructure on the productivity of farmers in the study area. The result of the study would be of immense benefit to policy makers by providing them with baseline information on the extent of road development in the study area and to identify those factors that requires immediate attention to improve farmers' output.

## Methodology

### Study Area

The study was carried out in Oke-ogun area of Oyo state, Nigeria. The state covers a total area of 27,249km<sup>2</sup> in land mass. Oke-ogun region of Oyo state has a land area of about 13,537 km<sup>2</sup> which is equivalent to about 60% of the total land mass of the present Oyo state. It has ten official local government areas (L.G.As) namely; Olorunsogo L.G.A, headquarter at

(Igbetti), Irepo (Kishi), Oorelope (Igboho), Atisbo (Tede), Itesiwaju (Otu), Iwajowa (Iwere ile), Kajola (Okeho) and Iseyin (Iseyin). The Local Government Areas are responsible for the maintenance of road infrastructure in the study area. The area has a combined population of 1,497,325 people (NPC, 2006). The zone occupies the guinea savannah area of the state and the people have farming as their predominant occupation. The climatic condition of the area is suitable for the production of large varieties of agricultural products which include: fruits like mangoes, cashew and pine apples, grains like maize, rice, melon, cowpea, soya bean, and others cereals, tubers like yam and cassava.

### Sampling Procedure

The study employed primary data using a well structured questionnaire and interview schedule to obtain information from the farming households. A three stage random sampling technique was employed for the study. The first stage involves a random selection of six Local Government Areas from the ten Local Government Areas in the zone. The second stage was a random selection of four villages from each of the selected Local Government Areas. The third and final stage was the random selection of five farming households from each of the selected villages so that we had a total of 120 farming households interviewed for the study.

### Analytical Tools

Descriptive statistics and multiple regression model were the major analytical tools employed for the study. Descriptive statistics such as frequency distribution, percentages, mean and mode was used to analyze socio-economic characteristics of the farming household as well as to examine the extent of road infrastructural development in study area. The multiple regression model was employed to examine the effect of road infrastructure on farmers' output.

### Regression and Econometric Analysis

The regression model is specified as follows;  
 $Y=f(X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, U)$

Where,

Y=Crop output of farmer (kg)

X<sub>1</sub>=Road access (dummy; yes=1, No=0)

X<sub>2</sub>=Farming experience (years)

X<sub>3</sub>=Educational level (years)

X<sub>4</sub>=Household size (Number)

X<sub>5</sub>=Purchased inputs (Naira)

X<sub>6</sub>=Fertilizer (Kg)

X<sub>7</sub>=Farm size (Ha)

U=Error term.

## Results and Discussion

### *Socio-Economic Characteristics of the Respondents*

Table 1 gives a summary of the socioeconomic characteristics of the farming households. As much as 46.7% of the respondents had no formal education while about 5% and 9% had secondary and tertiary education respectively. This implies that literacy level in the study area is relatively low.

The modal household size was 6 to 10 members (68%) and the average was 8 members per household. The relatively large household size might be due to the need for cheap family labour for farm activities in the study area. 50.9% of the respondents had 16-20 years of farming experience and the average years of farming experience was 20 years. 63.3% of the farming households were members of cooperative society while 36.7% were non member of cooperatives. Larger populations of the respondents (38.8%) cultivated 1.1ha to 2.0ha and the average land area cultivated by farmers in the study area was 2.3ha.

### *Road Infrastructure*

Table 2 shows a summary of the road characteristics in the study area. About 12% of the roads in the study were tarred. In terms of road maintenance, a good percentage of the roads (87.5%) were under maintenance. However, most of the road maintenance activities were being carried out by the farmers themselves with little assistance from the Local Government Areas.

The most dominant means of transportation employed by farming households in the study area was the vehicle (58.3%). Only 5% of the respondents claimed they transported their farm product using head pottage while about 36% used motorcycle

### *Effect of Road Infrastructure on Farm Output*

Table 3 shows the result of the ordinary least square regression analysis of the effect of road infrastructure on farm output. The result of the analysis showed that cost of inputs, farm size, fertilizer, labour and access to good roads were the major factors influencing farmers' output in the study area.

Access to good road was significant at 1% and had a positive relationship with the farmers' output. This implies that farmers with access to good roads in the study area were more likely to have a higher farm output compared to farmers without access to good roads. Hence rehabilitation of the roads leading to the farms is essential to raise farmers' output

and consequently increase their income. This result is similar to that obtained by Inoni and Omotor, (2009; Hartoyo, 2013). There is positive relationship between farm size and output which indicates that as farm size increases, output of the farmer also increases and vice-versa. This is expected because output increases with increase in hectrage of land all other things being equal. This result is similar to that obtained by (Adepoju and Salman, 2013). Cost of input and fertilizer usage was also found to have a direct relationship with output. This is understandable. It implies that farmers with higher investment in the purchase of the farm inputs got more outputs from their farms. This result is corroborated by that obtained by Adenuga *et al.* (2012) in their study of the Economics and technical efficiency of dry season tomato production in selected areas in Kwara State, Nigeria. In contrast to a priory expectation, Labour usage was found to have a negative relationship with output. This implies that as labour usage increases, output decreases. This may be attributed to excessive and inefficient use of family labour in the study area. Kassali *et al.*, (2012) obtained similar result in their study of effect of rural transportation system on agricultural productivity in Oyo State, Nigeria.  $R^2$  was 56% implying that the variables included in regression model (independent variables) accounted for about 56% variation in the crop output level (productivity) of the farmers in the study area.

## Conclusion and Recommendations

The extent of road infrastructural development in the study area is low as majority of the roads mostly plied by Lorries, buses and cars were not tarred though motorable and moderately maintained. The Result of ordinary least square regression showed that farm size, fertilizer, cost of input, labour and road significantly affect farmers' output while labour had negative relationship with output others had positive relationship. In line with the results of the study, the following recommendations were made.

Given that farm size was identified as one of the variables that contribute to increase in output, it is recommended that the governments should make policies that will encourage and allow farmers to gain more access to land, ensure tenure security and ownership of land. Construction of more rural roads is very essential to farmer's productivity. This will

facilitate access to inputs and product market by the rural farmers.

Output of farmers in the study area is influenced by fertilizer usage; hence the

formation of viable farmers' cooperatives to ensure increased availability, affordability and accessibility of fertilizers and other farm inputs is very essential

**Table1: Socio-Economic Characteristics of the Respondents**

Characteristics	Frequency	Percentage
<b>Educational Level</b>		
No Formal Education	56	46.7
Adult Education	37	30.8
Primary Education	9	7.5
Secondary Education	7	5.8
Tertiary Education	11	9.2
Total	120	100
<b>Household Size</b>		
1-5	20	16.7
6-10	82	68.3
11-15	13	10.8
16-20	4	3.4
>20	1	0.8
Total	120	100
<b>Farming Experience</b>		
10-15	49	40.8
16-20	61	50.9
21-25	8	6.6
26-30	2	1.7
Total	120	100
<b>Membership of Cooperatives</b>		
Yes	76	63.3
No	44	36.7
Total	120	100
<b>Farm Size</b>		
0.5-1.0	14	11.7
1.1-2.0	46	38.3
2.1-3.0	32	26.7
3.1-4.0	20	16.6
4.1-5.0	6	5.0
5.1-6.0	2	1.7
Total	120	100

**Table 2: Road Characteristics**

Road Characteristics	Frequency	Percentage
<b>Road Type</b>		
Foot path	10	8.2
Non tarred but motorable Road	75	58.3
Non tarred seasonal road	25	20.8
Tarred Road	15	12.5
Total	120	100
<b>Road Maintenance</b>		
Yes	105	87.5
No	15	12.5
Total	120	100
<b>Mode of Transportation</b>		
Head Portage	6	5.0
Bicycle	1	0.8
Motor Cycle	43	35.8
Lorry/Bus/Car	70	58.3
Total	120	100

Table 3: Result of Ordinary Least Square Regression Analysis.

Variables	Coefficient	Standard error	T static.
(constant)	764.855	2667.865	0.287
Road (yes or no)	6582.914***	1624.027	4.053
Cost of inputs (N)	0.021***	0.005	4.103
Farm size (ha)	1237.705***	412.463	3.001
Labour (man-day)	-18.877*	9.788	-1.929
Fertilizer (kg)	30.961***	7.414	4.176
Household size(No)	8.865	129.457	0.068
Education of farmers (yrs)	-83.435	82.182	-1.015
Farming experience (yrs)	34.352	45.471	0.756

R<sup>2</sup> = 0.558

Significance level \*\*\*p&lt;0.01, \*\*P&lt;0.05, \*P&lt;0.10,.

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