

# Influence of Transportation on Agricultural Productivity in Yakurr L.G.A

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## Abstracts

Transportation is very crucial to the economic development of all agricultural sector including other sectors. Transport is an artery for easy movement of goods from the areas of production to areas of consumption. The study employed questionnaire survey to elicit data from the respondents in the study. The questionnaire include information on nature of farming, means of transportation, means of transport to the market, influence of transport to the market among others. The result indicated that farming constitute the highest employment in the study area and farming is on commercial basis as shown by 50.0% respondents. The dominant mode of transportation in the area include motor cycles as shown by 50.0% of respondents followed by motor cars (32.5%). Transport also impose high cost on the farmer to transport their goods to the market indicated by 52.8% response. The data also indicate that this indicates high cost of goods taken to the market. Most of the goods are sold in the market as shown by 37.5% and 32.5% on Road side. Thus, the nature/types of road transport modes in Yakurr is actually affecting the marketing and production of agricultural produce. Hence recommended that Government should give priority to construction of accessible road from homes to the farm and from the farm to the market.

**Keywords:** Transportation, Accessibility, Agriculture, Produce, cost of goods, market

## INTRODUCTION

Transportation is regarded as a crucial factor in economic development. It enhances quality of life of the people, creates market for agricultural produce, facilitates interaction among geographical and economic regions and opens up new areas to economic focus (Ajiboye & Afolayan, 2009). Therefore, good network transport also aids innovation diffusion, expands production, and raise incomes (Ganon & Liu, 1997; Olukotun, 2007).

Improved transportation reduces travel time thereby, increasing the time thereby, increasing the time available for other economic and social activities. While also promoting access to basic facilities. Transportation does enhance agricultural production in terms of evacuation of food stuff from remote areas to the cities. The importance of transport arises from its role as one of the principal factors affecting the location and distributions of economic and social activities.

The Construction of Calabar–Ikom Highway in 1973 paved way for improved productivity and ease distribution of produce to other parts of the communities and to most of the urban areas within the state (Rasacki, 2005). This led to influx in population and increased economic, social and political activities in the area. The role of transportation is very crucial (Ajiboye & Afolayan, 2009). The impact of transportation on agricultural production in a developing country is seen to be very crucial as it moves around the axis of the rural dwellers. It is a phase in production process which is not complete until the commodity is in the hands of the final consumer (Adefolalu, 1977). Agricultural production is very important to the economy of developing nations as large proportion of the people depend on it for their livelihood.

Agriculture is a major occupation of people providing employment directly or indirectly for at least 60 percent of the people in Cross River State particularly Yakurr Local Government Area (Aihonsu, 1992). Most of the rural dwellers are traditional peasants, whose individual contribution may seem insignificant but collectively form important bed-rock for economy of the state which represents 90 percent of food and fibre produce in Nigeria (Aihonsu, 1992). The major agricultural products found in the study area are traditional cash crops such as rubber, cocoa, palm oil and kernel, cassava, yam and variety of arable crops like sugar cane, melon and others.

These products serve as food direct consumption and raw materials for agro-allied industries within and outside the state. The cash crops provide revenue to farmers and generate foreign exchange to the government. It therefore, requires a correspondently widespread transport network to take produce from farm to market (Ajiboye, 1995). Inadequate supply and high cost of food stuff is a result of inefficient transportation and distribution. Inadequate transport provision leads to the total waste of 25 percent of the total agricultural food stuff produced in Nigeria (Olajide, 1972). Similarly, Idachacba (1980), in his study of production problems in the rural areas contended that transportation among other factors represents the most serious constraint to agricultural production and development in Nigeria.

The kernel of discussion is a confirmation of the crucial role which transport plays in the socio-economic development of a nation, be it developed or developing, rural and urban especially in the movement of people, goods and services. Jegebe, (1992) observed that road transport has the most complex network, which covers a wide range of area and is physically more convenient and highly flexible. Road transport is the most

predominant mode of transportation and followed by head-parterage in Yakurr Local Government Area.

Road transportation is the most operationally suitable and readily available means of movement of goods and passenger traffic over short, medium and long distances in Cross River State in general and Yakurr L.G.A in particular, Ijared (2009).

Head portage transportation is explained by the relatively short distances from the place of origin to the destination, relatively scarce vehicles and the high cost of other means of transportation. This defines the head portage as a predominant way in transporting agricultural produce from source of origin to consumer destination. The use of foot and head portage decreases as the farmer move from the farm to the divisional headquarters for sells of agricultural produce which are relatively longer in distance. This is attributed to the introduction of motorcycle as a mode of public transportation in Nigeria including the rural areas as well as its low fuel consumption, low maintenance cost and its high flexibility. Bicycle haulage comes next followed by public transportation (i.e buses and pick-up vans), taxi and lorry respectively. In the rural area were vehicles are found and used, they only ply the roads on the market days and/or on the periodic days while on ordinary days traffic is generally very light and the frequency of patronage is often reduced to Zero during the rainy seasons (Ogundana, 1972; Ajiboye, 1994)

It is believed generally that transportation has a direct effects on production level of farmers as well as the price of crops. Large percentage of farmers trek to and from farms everyday even when facilities are available, because many of them barely afford such services because of low income earned. However, some privileged ones among use bicycles, motorcycles and other public means.

Fares for farmers and their products are considerably high and increasing everyday as reflected by or economic trend on oil products. For example, an average of ₦100 and above is paid as fare per kilometre on road. This observation shows the importance of transportation in agricultural development. If there are no good transport facilities, the farmers would not be able to produce more. Since they would not be quite sure of how they would evacuate the products from their farms and the price of the little available crop in the market would be very high and many people would not be able to afford food items. This certainly would have achieved considerable effect on the health of the citizenry, the production level on the agro-based industries and the general economy.

### **Theoretical underpinning**

Generally, rural area serve as the base for food fibre production, the major sources of capital formation for a country, and a principal market for domestic manufactures (Olayinwola & Adeleya, 2005). Rural settlement was also described by (Weir & McCabe, 2012) as areas with relatively low development densities typically less than one resident per acre. Sustainable rural development is a function of a number of factors in which transportation is of importance. Efficient and effective rural transportation serves as one of the channel for the collection and exchange of goods and services, movement of people, dissemination of information and the promotion of rural economy.

Planning is concerned with the objective and rational view of future conditions, assessing society desires, estimating the degree of control required, forecasting the amount of change and formulating policies to take account of this change and control (Adedeji, 2010). The provision of infrastructure as an approach to rural development is one of the methods mostly used by developing countries of the world. The theoretical proposition of infrastructural approach to rural development be it physical, social or institutional infrastructure, is predicated on the modernization theory called the “trickledown theory of development” (Oguzor, 2011).

Transportation as one of the tools of development is important and without it the inherent potentialities of an area may not be realized, be it rural or urban. Paul (2009) pointed out that the impacts of road infrastructure on agricultural output and productivity are particularly important in Sub-Saharan Africa for three reasons. First the agricultural sector accounts for a large share of gross domestic product (G.D.P) in most Sub-Saharan Countries (Paul, 2009) secondly, poverty is concentrated in rural areas on like the study area. Finally, the relatively low level of road infrastructure and long average travel times result in high transaction costs for sales of agricultural inputs and outputs, and this limits agricultural productivity and growth in the area

### **Methodology**

Yakurr occupies the Central part of Cross River State and lies between Latitude 5<sup>0</sup>40' and 6<sup>0</sup>10' North of the Equator and Longitudes 8<sup>0</sup>21' and 6<sup>0</sup>10' east of the Greenwich Meridian and 120km (75 miles) Northwest of Calabar, the capital of Cross River State. Consisting of ten major settlement including Ugep, Nko, Mkpani, Ekori, Agoi Ekpo, Agoi Mbami, Assiga, Idomi, Inyima, Kepeti, it covers an area of about 6,704.38 Square kilometres. It an agrarian society producing crops such as: Cassava, Yam, Plantain, Okoro among others.

Two sources of data were used, the primary source of data forms the major base for the study which includes administration of questionnaire, oral interview and respondents at different category of the sample area. The secondary data include population data and existing literature.

Stratified random sampling techniques was used to administered the structured questionnaire based on the stratification of Yakurr L.G.A and a selection of three communities namely; Ugep, Nko and Agoi for the Purpose of the study.

Copies of structured questionnaire were administrated to the various communities respectively in relation to their Population. Ugep is believed to be most populated followed by Nko and Agoi community as the least populated. The questionnaire was administered to the respondents in their various communities using systematic random sampling techniques with interval of four houses along major roads. In order; however, to sample a fair representation of respondents across the various communities:-

Ugep – 200,276 – which is the population figure 2015- Geonames.

Nko – 12,690, which also account for the population census of 1991

Agoi – 9,116 – by National population census 2006.

However, the Taro Yameni (1967) formula would be used in the determination of the sampled size which is given as;

$$n = \frac{N}{1 + N(e)^2}$$

Where

n = The sampled size

N = Population

1 = Constant

e = Level of significance (acceptable sample error) 0.05 level.

in the same vein, the proportionate formula would be used on the determination of the actual sample population between Ugep, Nko, and Agoi communities in terms of questionnaire administration. A total of 420 copies of questionnaires were distributed, while 402 were retrieved

## Results

### 4.1.1 OCCUPATION DISTRIBUTION OF RESPONDENT

Table 1 shows the occupational distribution of respondent 60 (15 percent) are student, 100 (25 percent) are civil servant, 70 (17.5 percent) of respondent are public servant, 30 (7.5 percent) of respondents are traders, 91 (22.5 percent) of respondent are farmers. While 31 (7.5 respondents) are engaged in one form of activity or the other. Thus, majority of respondent are civil servant followed by farmers in the sample.

**TABLE 1: OCCUPATION OF RESPONDENT**

CATEGORY	FREQUENCY	PERCENTAGE
Student	60	15
Civil Servant	91	22.5
Public servant	70	17.5
Trading	31	7.5
Farmer	100	25
Unemployed	30	7.5
Others	20	0.8
Total	402	100

Source: Author's Fieldwork August, 2016.

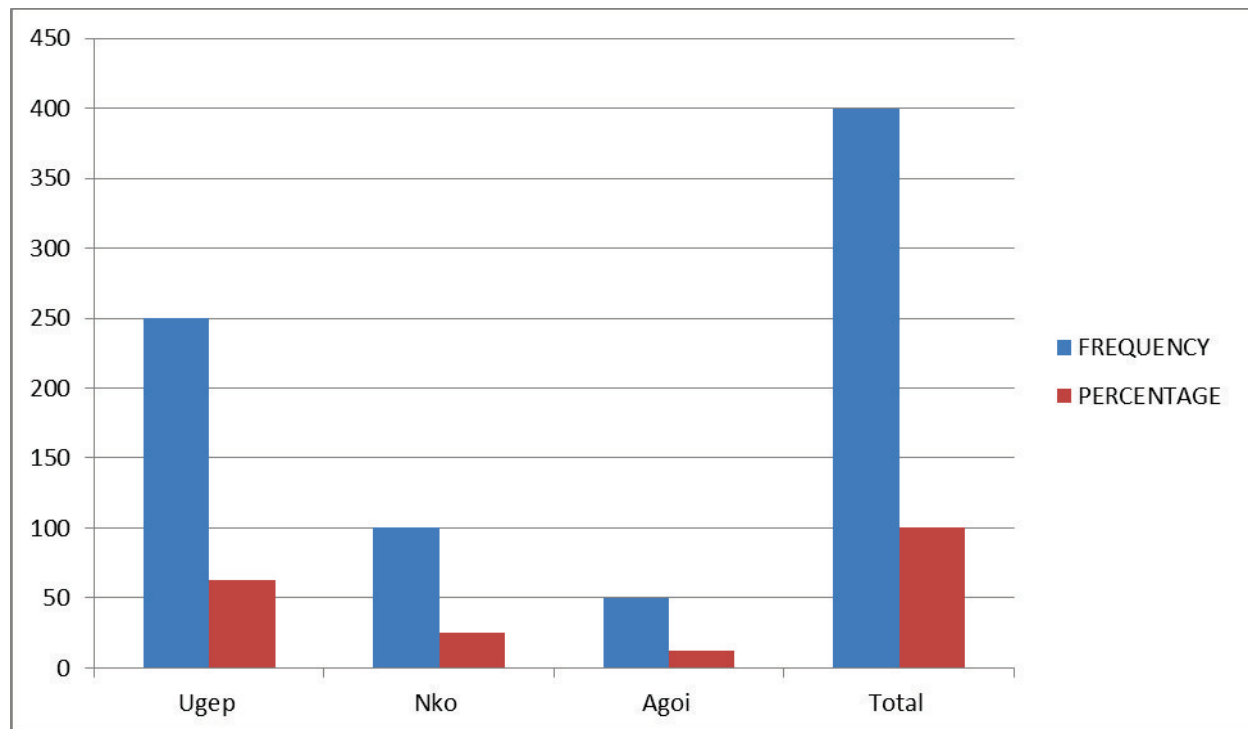
### 4.1.2 FREQUENCY DISTRIBUTION OF RESPONDENT BASED ON COMMUNITY

Table 2 shows the various communities in which the respondents reside. Two hundred and One (62.5 percent) of respondents are from Ugep, 100 (25 percent) are from Nko, while 51 (12.5 percent) of respondents are from Agoi. Majority of the respondents are those from Ugep, followed by those that are from Nko.

**TABLE 2: DISTRIBUTION OF RESPONDENT BASED ON COMMUNITY**

CATEGORY	FREQUENCY	PERCENTAGE
Ugep	251	62.5
Nko	100	25
Agoi	51	12.5
Total	402	100

Source: Author's Fieldwork August, 2016.



**FIG 4: THE FREQUENCY DISTRIBUTION OF RESPONDENT BASED ON COMMUNITY**

Source: Author's Fieldwork August, 2016.

#### 4.1.3 NATURE OF FARMING BY RESPONDENTS

The data on table 3 reveals that 201 (50 percent) of the farmer engaged on commercial farming, 151 (37.5 percent) of respondent engaged on subsistence farming. While 50 (12.5 percent) of respondent engaged on subsistence/commercial farming. Hence, majority of the respondent engage in commercial farming in the sample.

**TABLE 3: NATURE OF FARMING BY RESPONDENTS**

CATEGORY	FREQUENCY	PERCENTAGE
Commercial	201	50
Subsistence	151	37.5
Commercial/subsistence	50	12.5
Total	402	100

Source: Author's Fieldwork August, 2016.

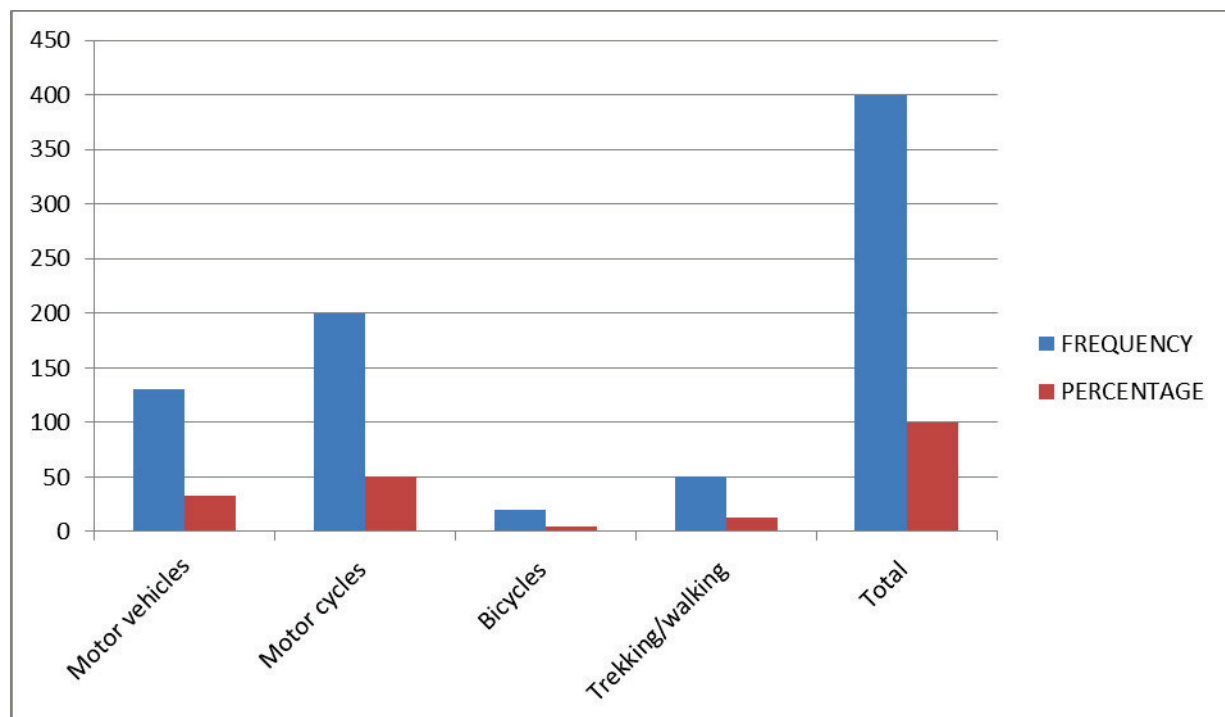
#### 4.1.4 VARIOUS TRANSPORTATION MODES/MEANS BY RESPONDENTS

The data on table 4 reveals that 131 (32.5 percent) of respondents use vehicles as means of transportation, 200(50.0 percent) use motorcycle, 20 (5.0 percent) use bicycles while 51 (12.5 percent) of respondents use trekking/walking as a means of transportation. Thus, most of the respondents makes use of motor cycles as means of transportation mode in the sample.

**TABLE 4: TRANSPORTATION MODEL/MEANS BY RESPONDENTS**

CATEGORY	FREQUENCY	PERCENTAGE
Motor vehicles	131	32.5
Motor cycles	200	50.0
Bicycles	20	5.0
Trekking/walking	51	12.5
Total	402	100

Source: Author's Fieldwork August, 2016.



**FIG 5: TRANSPORTATION MODES/MEANS BY RESPONDENTS**

Source: Author's Fieldwork August, 2016.

#### 4.1.5 TRANSPORTATION MEANS BETWEEN THE MARKET AND FARM BY RESPONDENT

Table 5 shows that 50 (12.5 percent) of respondent do trek/walk to the market and farm, 131 (23.5 percent) use vehicles, 201(50.0 percent) of respondent use motor cycles, while 20(5.0 percent) of respondents make use of bicycles to the farm/market. Majority of the respondents make use of motor cycles to the market and farm in the sample.

**TABLE 5: TRANSPORTATION MEANS BETWEEN MARKET AND FARM BY RESPONDENT**

CATEGORY	FREQUENCY	PERCENTAGE
Trekking	50	12.5
Motor vehicles	131	32.5
Motor cycles	201	50.0
Bicycles	20	5.0
Total	402	100

Source: Author's Fieldwork August, 2016.

#### 4.1.6 INFLUENCE OF TRANSPORTATION ON MARKET PRICES OF AGRICULTURA BY RESPONDENTS

The data in Table 6 reveals that 212(52.5 percent) of respondents ticked high, 80(20 percent) ticked "moderate", 60 (15) percent ticked "low" 30(7.5 percent) ticked not at all, while 20(5.0 percent) of respondent said they "don't know". Hence, most of the respondents ticked high which has the highest percentage in the sample.

**TABLE 6: INFLUENCE OF TRANSPORTATION ON MARKET PRICES OF AGRICULTURA BY RESPONDENTS**

CATEGORY	FREQUENCY	PERCENTAGE
High	212	52.8
Moderate	80	20
Low	60	15
Not at all	30	7.5
Don't know	20	5.0
Total	402	100

Source: Author's Fieldwork August, 2016.

#### 4.1.7 CONDITION OF ROAD BY RESPONDENTS

The data on Table 7 reveals that 151 (37.5 percent) of respondents ticked tarred well surface, 50(12.5 percent) ticked "seasonal earth road", 71 (17.5 percent) ticked "not motorable all season", 50(12.5 percent) ticked "not motorable only in wet season", 30 representing (7.5 percent) ticked farm road, while 50(12.5 percent) of respondents ticked "footpath". Thus, it reveals that the condition of the road is well tarred surfaced followed by

“not motorable all season” in the sample.

**TABLE 7: CONDITION OF ROAD BY RESPONDENT**

CATEGORY	FREQUENCY	PERCENTAGE
Well surface tarred	151	37.5
Seasonal earth road	50	12.5
Not motorable all season	71	17.5
Not motorable only in the wet season	50	12.5
Farm road	30	7.5
Footpath	50	12.5
Total	402	100

Source: Author’s Fieldwork August, 2016.

**4.1.8 VOLUME OF VEHICULAR TRAFFIC BY RESPONDENTS**

Table 8 shows the volume of vehicular traffic in the study area. One hundred and fifty one (37.5 percent) of respondents said that the volume of vehicular traffic is “always large”, 51 (12.5 percent) said it “always small”, 200(50 percent) said it “always large only on market days”. Hence, the volume of vehicular traffic is, “always large only on market days” because it has the highest percentage in the sample.

**TABLE 8 : VOLUME OF VEHICULAR TRAFFIC BY RESPONDENTS**

CATEGORY	FREQUENCY	PERCENTAGE
Large always	151	37.5
Small always	51	12.5
Large only on market days	200	50
Total	402	100

Source: Author’s Fieldwork August, 2016.

**4.1.9 DISTRIBUTION OF RESPONDENTS ON THEIR OPINION OF TRANSPORTATION FARE IN THE STUDY AREA**

The data in the Table 9 show whether or not the transportation fare is high, 152 (37.5 percent) of respondents ticked “Yes”, while 200 (50 percent) of respondent ticked ”No”, and 50 (12.5 percent) of respondents said they don’t know it is high or not.

**TABLE 9: TRANSPORTATION FARE BY RESPONDENTS**

CATEGORY	FREQUENCY	PERCENTAGE
Yes (high)	152	37.5
No (low)	200	50.0
Don’t know	50	12.5
Total	402	100.0

Source: Author’s Fieldwork August, 2016.

**4.1.10 HIGH TRANSPORTATION FARE BY RESPONDENT**

Table 10 shows the cause of high transportation fare in the study area. Ninety one (22.5 percent) of respondents claimed high cost of vehicle spare parts, 151 (37.5 percent) respondents ticked bad roads, 50 (12.5 percent) ticked low volume of passengers, 50(12.5 percent) ticked low volume of agricultural goods, while 60(15 percent) of respondents ticked others. Among the causes of high transportation fare in the study area bad road is the major culprit.

**TABLE 10: HIGH TRANSPORTATION FARE**

CATEGORY	FREQUENCY	PERCENTAGE
High cost of vehicles spare parts	91	22.5
Bad roads	151	37.5
Low volume of passengers	50	12.5
Low volume of agricultural goods	50	12.5
Others	60	15.0
Total	402	100.0

Source: Author’s Fieldwork August, 2016.

**4.1.11 COST OF GOODS CARRIED FROM FARM TO MARKET BY RESPONDENTS**

The data in table 11 reveals the cost of good carried from the farm to the market. Thirty (7.5 percent) of respondent claimed ₦100, 51 (12.5 percent) claimed ₦200, 71 (17.5 percent) ticked ₦300, while 250 (62.5 percent) ticked above ₦400, the cost of goods carried from the farm to the market is above 400 from the sample.



**TABLE 11: COST OF GOODS BY RESPONDENT**

CATEGORY (₦)	FREQUENCY	PERCENTAGE
100	30	7.5
200	51	12.5
300	71	17.5
Above 400	250	62.5
Total	402	100.0

Source: Author's Fieldwork August, 2016.

**4.1.12 LACK OF VEHICLE BY RESPONDENT**

The table gives statistics on the reason(s) why there is the problem of lack of vehicles in the study area. One hundred of respondents (37.5 percent) claimed inaccessible roads, 151 (37.5 percent) of respondents claimed low volume of goods/produce while 100 (25 percent) claimed other factors. Generally, lack of vehicles is caused by inaccessible roads, followed by low volume of goods/produce in the study area.

**TABLE 12: LACK OF VEHICLE**

CATEGORY (₦)	FREQUENCY	PERCENTAGE
Inaccessible roads	151	37.5
Low volume of goods/produce	151	37.5
Others	100	25.0
Total	402	100.00

Source: Author's Fieldwork August, 2016.

**4.1.12 MARKETING/SALE OF AGRICULTURAL PRODUCE BY RESPONDENT**

Table 13 shows the marketing/sale of agricultural produce in the study area. Fifty One (12.5 percent) of respondents claimed farm, 151 (37.5 percent) claimed market, 130 (32.5 percent) ticked road side, while 70 (17.5 percent) ticked all of the above. Hence, most of the respondents sale their agricultural produce in the market and on the road side in the sample.

**TABLE 13: VOLUME FOR MARKETING/SALE OF AGRICULTURE PRODUCE**

CATEGORY	FREQUENCY	PERCENTAGE
Farm	51	12.5
Market	151	37.5
Road side	130	32.5
All of the above	70	17.5
Total	402	100

Source: Author's Fieldwork August, 2016.

**DATA ANALYSIS**

The hypothesis that there is no significant difference in transport modes and the volume of agriculture produce sale was carried out.

CATEGORY	UGEP	NKO	AGOI	TOTAL
Motor vehicles	30	50	50	132
Motor cycles	100	50	50	200
Bicycles	5	5	10	20
Trekking/walking	25	15	10	50
Total	160	120	120	402
$\chi^2$	25600	14400	14400	

Source: Author's Fieldwork August, 2016.

**ANOVA RESULT OF DIFFERENCES IN THE NATURE OF ROAD MODE SYSTEM AFFECTING THE MARKETING OF AGRICULTURAL PRODUCE**

Group treatment	Df	SS	MS	F-Ratio	F-critical
Between	2	355.55	177.78		
				0.029	5.140
Within	6	362666.67	6044.45		
Total	8	36622.22	6222.23		

Source: Author's Fieldwork August, 2016.

**Discussion**

Indeed, adequate and efficient transportation network is a cornerstone of the modern food marketing system.

Transportation thus, serves as a means of moving goods, ideas and information geared towards increased productively. In Nigeria, roads constitute perhaps, the most important infrastructure in the structural transformation of her agriculture. Thus, rural transportation and other aspects of infrastructural development in Nigeria have been topical issues and have been identified by many as crucial components for economic development of the country (Adedeji, 2014). According to (Ajiboye & Afolayan, 2009) transportation is regarded as a crucial factor in improving agricultural productivity. It enhances quality of life of the people, creates market for agricultural produce, facilitates interaction among geographical and economic focus.

## CONCLUSION

The nature/types of road transport modes in Yakurr is actually affecting the marketing and production of her agricultural produce, this is on the basis that most of the farmers don't have an access to vehicles, motor cycles or bicycles to take them from their homes to the farm and from the farm to the market and as well to other areas for an effective production and distribution of her agricultural produce. While the privilege one's that can afford the above are very few according to findings, as such the price of agricultural produce is a function of transportation cost when the cost is high, not moderate and not low interestingly, the processing of agricultural produce depends largely on transportation (infrastructure), when the rate is low it enhance the farmers to effective and efficient production of crops.

However, despite the price of agricultural produce, certain factors serve as hindrances such factors include; high cost of vehicle spare parts, bad roads and low volume of passengers/agricultural goods.

Hence, if the stated recommendation from the respondent are implemented it will go a long way in enhancing the economy of the people and that of the nation.

## Recommendation

Based on the research findings the following recommendation are suggested:

- (1) Maintenance of existing roads through the help of government with partnership of NDDC should be called to order.
- (2) Construction of accessible road from homes to the farm and from the farm to the market, and finally to the place of consumption should be a priority in the hand of the government
- (3) The price of vehicle spare parts should be brought down and also government should allow private production and manufacturing of these spare part so that there will be a kind of competition between the government and private manufacturing as such the prices will be brought down
- (4) Rehabilitation of the old road should be put in place by the relevant agencies.
- (5) more agricultural activities and the production process will also be effective and efficient.

## REFERENCES

- Adedeji, Lucas, Ramp, Ovubude, Adesanya, Musa, Owen, World Bank, Hirschman (1998, 2000, 2007, 2011, 1968, 1959) All in transport problems in Nigeria.
- Adefolalu, A. A (1997). "Significance of Transportation in Rural development in Environmental and rural Development in Environmental and Spatial Factors". Proceeding of 20<sup>th</sup> Annual conference of Geographical Association of University of Ife, Ile-Ife.
- Aderamo, A. J & Magaji, S. A (2010). Rural Transportation and the Distribution of public facilities in Nigeria: A case study of Edu Local Government Area of Kwara State.
- Aihosu, O. A (1992). "Traditional Agricultural in Onakomaiya, et al (eds) Ogun State in Maps. Rex Charles Publication, Ibadan.
- Ajiboye A. O & Olaogun, O. B (2006). Analysis of mobility characteristic of Rural Areas in Sub-Saharan Region: case from Nigeria.
- Ajiboye A. O. (1995). "Transportation and Distribution of Agricultural Products. A case study of Kolanut product Remoland Ogun State".
- Ajiboye, A. O & Ayantoyimbo, B. B (2009). Analysis of Transportation and Distribution Problems of Agricultural Products Marketing in Sub-Saharan Region.
- Ajiboye, A. O. (1994). "Rural Accessibility and Transportation Problems. A case study of Ije North Local Government Area, Ogun State".
- Ajiboye. A. O & Afolayan (2009). The impact of transportation on agricultural production in a developing country: a case of Kolanut production in Nigeria.
- Aloba et al (1983). Spatial Development of Rural Road Transportation in Nigeria.
- Aloba, O. (1986). Rural Transportation in: Ifalola, S. A Olarewaju (Ed.s): Transport system in Nigeria. Syracuse University, Maxwell School of Citizenship and public Affairs Series XLII: 125-138.
- Amaza, P. S. Bila, Y & Oheanacho, A C. (2006). Identification of Factors that influence Technical Efficiency of



- Food Crop production in West Africa: Empirical Evidence from Borno State, Nigeria. *Journal and Subtropics*, 107(2), 139-147.
- Filani, M. O (1995). Transportation and Rural Development in Nigeria. *Journal of Transport Geography*, 1:248-254.
- Ganon & Liu, 1997; Olukoton (2007). "Nature of transport network and innovation in rural areas.
- Hoyles (1973). "On transport development and the Importation on Social Economic activities.
- Hyoung-Gun, P. D, Liange W. Y & Emily S. (2009). Crop Production and Road Connectivity in Sub-Saharan Africa: A Spatial Analysis. Africa Infrastructure Country Diagnostic Working paper 19. A Publication of the World Bank.
- Jegade & Afoleyan (1992-2009). The complexity of Road Network in Nigeria.
- Leman, J. H & Cookling E .C (1975). Transport change and agricultural specialization in Nigeria.
- Mabogunje, A L (1980). The Development process A spatial Perspective, London: Hutchinson Press.
- Mabogunje, B. (1971). "Crisis in Rural Development planning in Nigeria".
- Ogben, (1997). "The bulky nature of agricultural product.
- Ogundana B. (1972). "The transport constraint on Rural Development in Nigeria".
- Ogunsanya, A. A. (1988). A case for Rural Transport Policy in Nigeria.
- Oguzor (2011). Trickle Down Theory of Development (Growth pole Theory).
- Olajide 1972; Idachacba, 1980 & Jegebe, 1992. "The complex network of transport in Nigeria. *Journals* pp 342.
- Olajide 1972; Idachacba, 1980 & Jegebe, 1992. "The complex network of transport in Nigeria. *Journals* pp 342.
- Olayiwola & Adeleya (2005). Sustainable Rural Development Network in Nigeria.
- Tuned, A. M & Adeniyi, E. E (2012). Impact of Road Transport on Agricultural Development: A Nigerian example.