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Impact Of Road In Socioeconomic Development Of Rural Communities: A Case Study Of Okurikang – Atan Eki Road, Odukpani Local Government Area, Cross River State, Nigeria

ESUABANGA, W. E.[1], OSUORJI, G. C.[2], SODANGI, A. A.[3], ODETORO, D. A.[4]

[1,2,3&4]Research officers, Nigeria Building and Road Research Institute, Km 10, Idiroko Road, Ota, Ogun State, Nigeria
Correspondence:esuabangawilliam@gmail.com

ABSTRACT
This research was focused on the impact of road in socioeconomic development of rural communities using Okurikang-AtanEki Road in Odukpan Local Government Area of Cross Rivers State, Nigeria. Three objectives were set for the study. Three hypotheses were set as follows: there is no significant different in the occupation, in income and the number of small/medium scale business in the host communities before and after the road pavement. Questionnaires were administered and analyzed with descriptive and inferential statistical tools. The study revealed a significant impact of road on socioeconomic development of the host communities in terms of occupation, income and number of small/medium scale business attached to the host communities after the road pavement project. H_1 was upheld indicating a significant difference in occupation, income and the number of small/medium scale business having calculated values of 3.08, 3.54 and 5.47 is greater than the table of value at 0.05 significant levels respectively. The study concluded that road has a great impact on socioeconomic development of the host communities of Okurikang-Atan Eki road. Some recommendations were made in line with the study.
Keywords: Impact, Socioeconomic Development, Rural Communities, Road pavement and Isolation

INTRODUCTION

Most times, the rural communities are said to be backward and underdeveloped due to several factors. One of the key factors that keep on ringing in the minds of rural communities without road(s) is "isolation" as a result of poor or lack of road network. For a place to be rural, it has less than 20,000 people and predominately engaged in primary activities and production (Adeniyi et al, 2018). It is an area characterized with relatively low development densities and low population (Weir and Mc Cabe, 2012). A road is an economic penetrating route which is required to open ways for investment by stimulating various types of socioeconomic activities such as agriculture, trade, tourism, commerce, etc. Roads are integrated system that is made up of nodes and routes (Said, 2008). Towns or communities link by road(s) are referred to as nodes while the road itself is the route. According to Vinod et al, (2013), road networks are regarded as determinants factor which speed up growth and development of a locality. A study by international fund for agricultural development (IFAD, 2001), revealed that distance to markets and lack of roads have been a major concern for rural communities throughout the developing world. The need for road by both urban and rural communities cannot be over-emphasized given the fact that more ninety percent (90%) of internal movement of goods and person takes place by road (Musa, 2003). Commercial outfits and activities are known to cluster around road networks (Hashian and Adamu, 2018). Rural roads

in sub-Sahara Africa have a multiplier effect in all facets of our rural and urban economy such as schools, health care, income, technology/innovation, etc. The World Bank (2016) had come to conclusion that poverty alleviation strategy for most rural communities should be inclusive of road infrastructures mostly in isolated localities. This became crucial because the road to break out from poverty is dependent on the need to first break out of isolation (John, 2015).

From the foregoing, this study attempts to assess the impact of road transport on socio-economic development of some affected communities. Despite wide range of studies on impact of road(s) on some localities by some noble scholars, it has been observed that none have specifically come out with a measurable impact of road on socio-economic development of the host communities using key indicators such as income, occupation, and small/medium scale enterprises. Also among all these study conducted on impact of road on rural communities, none have ever been done on Okurikang – Atan Eki road in Odukpani local government area of Cross River state, Nigeria, and this is the gap in which the study is intended to fill.

Aims and Objectives

The aim of this study is to examine the impact of rural road on socio-economic activities of the rural areas using Okurikang – Atan Eki road as a case study. In order to achieve this aim some objectives were put forward as guidelines towards the realization of this aim. The objectives are:

1. To assess the impact of the rural road on the occupation of the host communities before and after the construction of the road.
2. To determine the impact of the rural road on the income of the host communities before and after the construction of the road.
3. To assess the number of small and medium scale business attracted to the host communities before and after the construction of the road.

Hypotheses

The research hypotheses for this study are stated as follows:

Hypothesis One

H_0 – There is no significant difference in the occupation of the host communities before and after the road pavement.

H_1 – There is a significant difference in the occupation of the host communities before and after the road pavement.

Hypothesis Two

H_0 – There is no significant improvement in the income of the hos communities before and after the road pavement.

H_1 – There is a significant improvement in the income of the host communities before and after the road pavement.

Hypothesis Three

H_0 – There is no significant difference in the number of small/medium scale business in the host communities before and after the road pavement.

H_1 - There is a significant difference in the number of small/medium scale business (SMS) in the host communities before and after the road pavement.

Study Area

The communities chosen for this study were those ones that are found along the road designated as Okurikang – Atan Eki road. The villages are Okurikang, Idim Ndom, Atan Eki, Oborio and Ekpene Eki all in Odukpani Local Government Area of Cross River state, Nigeria. The road is 30km long and 5m wide single lane (Trunk B - road) constructed by the Cross River state government ten (10) years ago under rural road development programme. The road begins at Okurikang junction with co-ordinates (Lat. 5^o 10’ 12”, long. 8^o 10’ 25”) and terminated at Atan Eki beach (lat.5^o 18’ 01”, long. 8^o 01’ 00”). The economic activities of the host communities includes; fishing, farming, trading and artisan. The major means of transportation are by foot, bicycle, motorcycle, canoe and some scanty vehicles.

MATERIALS AND METHODS

Global positioning system (GPS) was used in obtaining the coordinates of the study area while tape was used in taking the measurement of the road. The study adopted the double difference method of testing the socioeconomic impact of the road on the host communities before and after the road pavement. The 1991 population census data was used to get the base population of the host communities and projected to 2019.Taroyamene (1967) population sampling technique was adopted to achieve the needed population size of the study area. Questionnaires were administered to the residents for primary data while secondary data was obtained from books, journals, magazines, internet etc. Data obtained for the study focuses on socioeconomic characteristics of the residents such as age, income, marital status, occupation, small/medium scale business both before and after construction of the road. Data obtained from the questionnaires were analyzed using descriptive statistical tool such as percentage, charts, and tables. Hypothesis for this study was analyzed using students correlated T-test (Isangedighi et al, 2004) as stated below

$$t = \frac{đ}{Sđ}$$

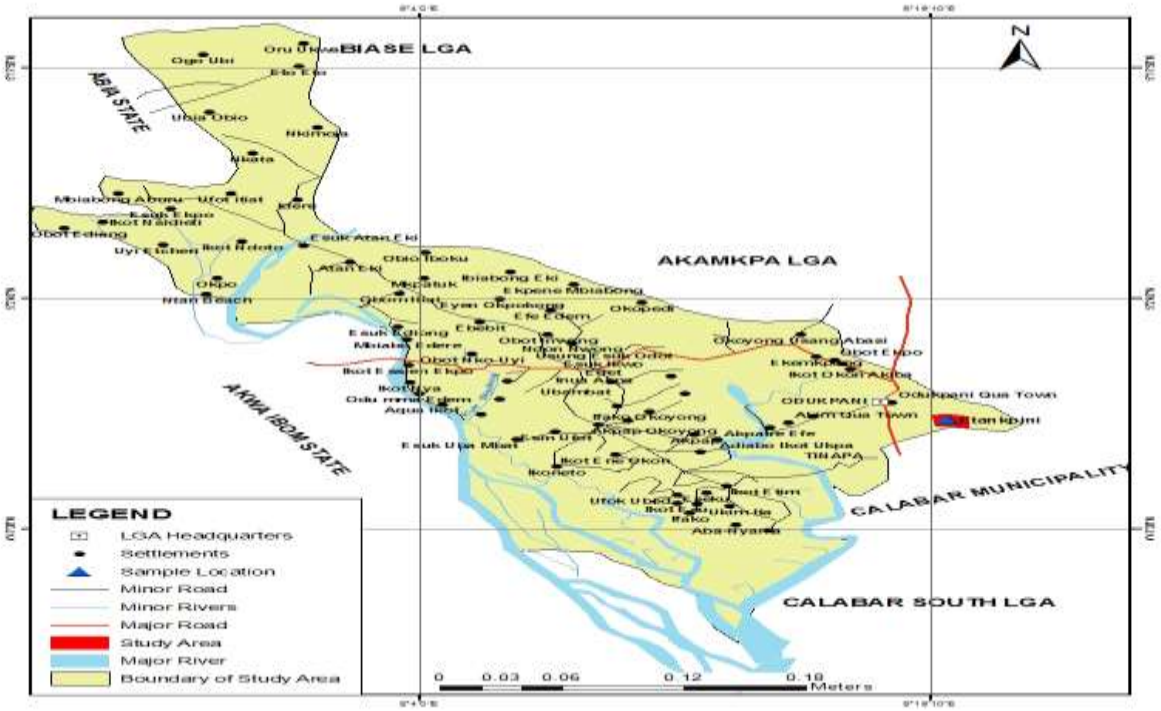

Fig. 1. Map of the study area

Where
t = student correlated T-test,
đ = mean of different scores,
Sđ = standard error of the difference between paired scores.

$$Sđ = \frac{Sd}{\sqrt{N}}$$

$$Sd = \sqrt{\frac{\sum d^2 \frac{(\sum d)^2}{N}}{N-1}}$$

RESULT AND DISCUSSION

Table 1: Pattern of distribution of questionnaire

S/N	Villages	1991 census data	2019 projection	Population sample	Questionnaire returned	Questionnaire not returned	Questionnaire not filled
1	Okurikang	1441	2901	77	76	1	0
2	Idim Ndom	901	1814	77	75	2	1
3	Atan Eki	1541	3103	80	75	3	2
4	Obodio	1300	2617	77	73	3	1
5	Ekpene Eki	1098	2211	77	74	2	1
	TOTAL	6281	12646	388	373	11	4

Source: field work, 2019

The table above shows that a total of three hundred and eighty-eight (388) questionnaires were administered in the cause of this study within the selected communities, out of which three hundred and seventy-three (373) were completed and returned while eleven (11) were not returned and four (4) was not filled.

Table 2: Gender distribution

Gender	Frequency	Percentage (%)
Male	202	54
Total	373	100

Source: field work, 2019

The table above shows gender distribution of the respondents. A total of two hundred and two (202) males responded which represents fifty-four percent (54%) of the total questionnaire returned and one hundred and seventy-one (171) were females representing forty-six percent (46%).

Table 3: Marital status of respondents

Marital Status	Frequency	Percentage (%)
Single	78	21
Married	160	43
Widow/Widower	78	21
Divorced	57	15
Total	373	100

Source; field work, 2019

Table 3 above shows the marital status of the respondents. Those married have the highest response with 160(43%), followed by singles and widowed with 78 (21%) each and divorced with 57(15%).

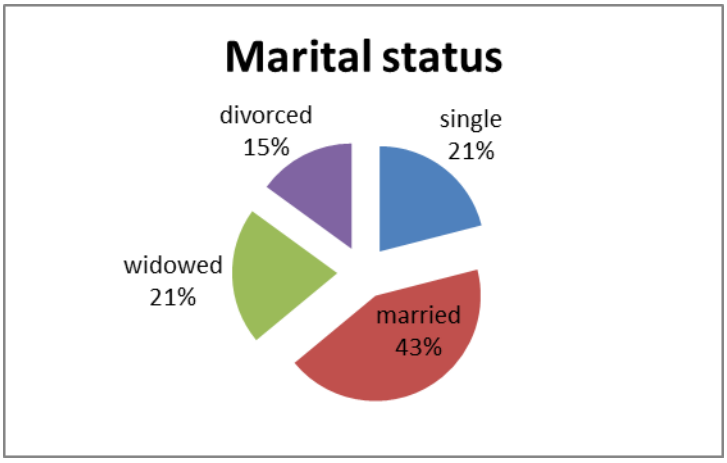

Fig. 2:Pie chart illustrating the marital status of respondents

Table 4: Age distribution of the respondents

Age	Frequency	Percentage (%)
18 – 30	68	18
31 – 40	69	18
41 – 50	59	16
51 – 60	74	20
61 and above	103	28
Total	373	100

Source: field work, 2019

Table 4 above shows the age distribution of the respondents. 61 years and above was the highest with 103 (28%), followed by 51 – 60 years with 74 (20%), then 18 -30 years, 31 – 40 years, and 41 – 50 years with 68 (18%), 69 (18%) and 59 (16%) respectively.

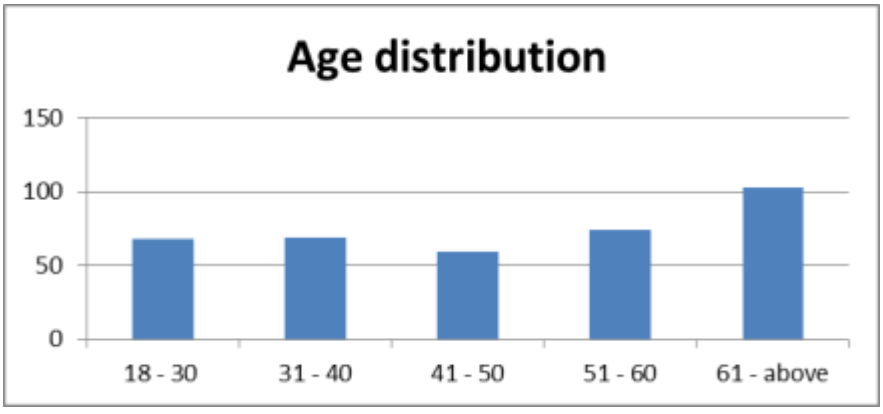

Fig. 3: Bar chart showing the age distribution of the respondents

Table 5: Occupation of the respondents before and after road pavement

	Before Road pavement		After Road pavement	
Occupation	Frequency	Percentage (%)	Frequency	Percentage (%)
Business	44	12	64	17
Civil servant	40	11	45	12
Farming/Fishing	128	34	120	32
Transporters	33	9	43	12
Artisans	49	13	59	16
Others	79	21	42	11
Total	373	100	373	100

Source: field work, 2019

Table 5 above shows the occupation of respondents before and after the road pavement. Before road pavement, fishing/farming has the highest frequency of 128(34%) which confirms the definition of rural community according to Akinrinmade and Abiodun (2018) that a rural community engages in mostly primary activities. Other occupations that could not be classified has a frequency of 79(21%), artisans 49(13%), business 44(12%), civil servants 40(11%), and transporter 33(9%).

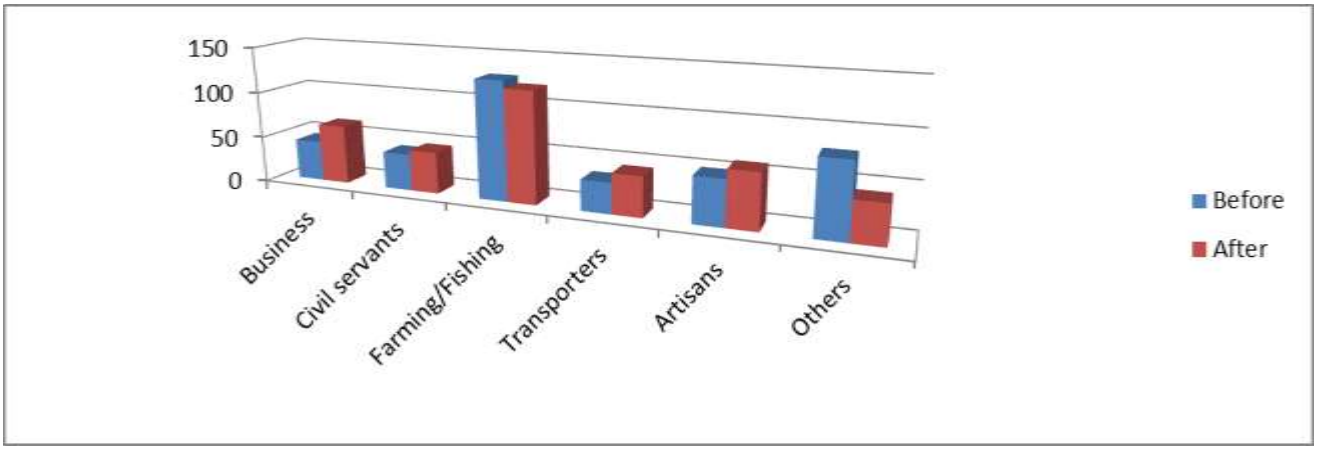

Fig 4: chart showing occupation of respondents before and after road pavement

After road pavement, fishing/farming has the highest frequency of 120(32%), followed by business with 64(17%), artisans 59(16%), civil servants 45(12%), transporter 43(12%), and other occupations that could not be classified has a frequency of 42(11%).

This shows the capacity of road infrastructure to change the occupational structure of a locality from primary to secondary production.

Table 6: Income (₦) per month of the respondents before and after road pavement

	Before Road pavement		After Road pavement	
Income (₦)	Frequency	Percentage (%)	Frequency	Percentage (%)
< 20,000	41	11	10	3
20,000 – 40,000	101	27	91	24
41,000 – 60,000	95	26	103	27
61,000 – 80,000	64	17	71	19
81,000 – 100,000	54	14	62	17
> 101,000	18	5	36	10
Total	373	100	373	100

Source: field work, 2019.

Table 6 above shows the income of the respondents before and after road pavement. Before road pavement, 20,000 – 40,000 ranked highest with 101(27%), followed by 41,000 – 60,000 (95, 26%), 61,000 – 80,000 (64, 17%), 81,000 – 100,000 (54, 14%), < 20,000 (41, 11%), and > 101,000 (18, 5%). After road pavement, 41,000 – 60,000 ranked highest (103, 27%), followed by 20,000 – 40,000 (91, 24%), 61,000 – 80,000 (71, 19%), 81,000 – 100,000 (62, 17%), > 101,000 (36, 10%), and < 20,000 (10, 3%).

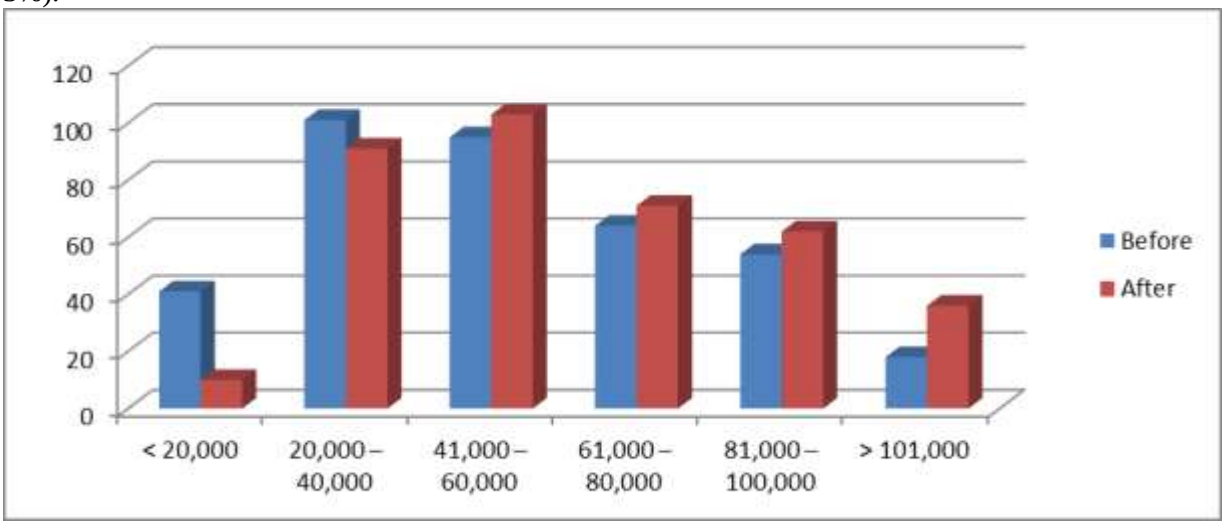

Fig. 5: chart showing income of respondents before and after road pavement.

The figure above shows a remarkable change in the income of the host communities after the road pavement, this result is in agreement with the World Bank (2016), that poverty alleviation strategy must include building road infrastructures in localities that are isolated. As such, a key indicator of poverty is income, and this study has shown a positive change in the income structure of the host communities after the road pavement.

Table 7: Number of small and medium scale (SMS) businesses before and after road pavement.

	Before Road pavement		After Road pavement	
SMS	Frequency	Percentage (%)	Frequency	Percentage (%)
General provision shops	45	27	59	24
Tailoring shops	38	23	49	20
Carpentry/wood work	18	11	23	9
Welding/fabrication	9	5	13	5
Hair dressing salon	31	19	38	15
Restaurants/food vendor	8	5	28	11
Computer/business center	4	2	8	3
Private schools	3	2	7	3
Vehicle/electronic repair	2	1	6	2
Others	9	5	17	7
Total	167	100	248	100

Source: field work, 2019

Table 7 above shows the number of randomly selected small and medium scale business before and after the road pavement. Before the road pavement, general provision shop was the leading SMS in the community (45,27%), followed by tailoring shops (38, 23%), hair dressing salon (31, 19%), carpentry/woodwork (18, 11%), welding/fabrication (9, 5%).

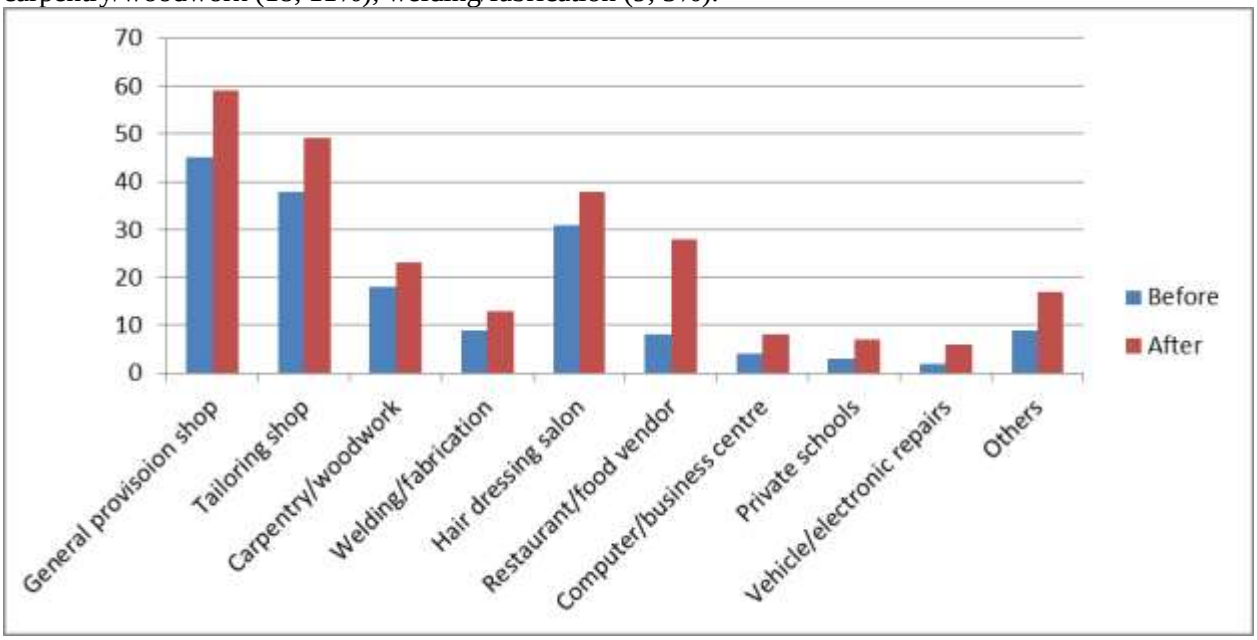

Fig. 6: chart showing number of SMS before and after road pavement.

Furthermore, after the road pavement, general provision shops leads (59, 24%), followed by tailoring (49, 20%), hair dressing salon (38, 15%), restaurant/food vendor (28, 11%), carpentry/wood work (23, 9%), others (17, 7%).

The total number of SMS increased from 167 to 248 after the road pavement. This result agrees with Vinod et al (2013) that road is a determinant factor that speeds up growth and development in a locality.

Table 8:Student correlated T-test analysis of occupation of respondents before and after road pavement.

Occupation	Before road construction(X_1)	After road pavement (X_2)	Difference scores (d)	(Difference scores)^2 (d^2)
Business	44	64	-20	400
Civil servant	40	45	-5	25
Farming/fishing	128	120	8	64
Transporters	33	43	-10	100
Artisans	49	59	-10	100
Others	79	42	37	1369
Total	373	373	90	2058

Source: Field work data analysis, 2019

Table 9: Summary of correlated t-test analysis

Categories	Number	Before (X_1)	After (X_2)	∑ d	∑d^2	Sd	Sđ	Đ	t-value	Table value
occupation	6	62.16	62.16	90	2058	11.89	4.87	11.89	3.08	2.015

Source: statistical computation from field work, 2019 (see appendix 1 for full details)

Table 9 shows that the calculated t-value of 3.08 is higher than that of the total value (N – 1) at 0.05 which is 2.015. The H_0 (null hypothesis) is rejected and H_1 (alternate hypothesis) is upheld. This means

that there is a significant difference in occupation of the respondents after the road pavement. This is seen in the study area in which after the road pavement, the occupation of the respondents began to shift from primary to secondary and tertiary production sector.

Table 10: Student correlated t-test analysis of income of respondents before and after the road pavement

Income	Before (X_1)	After (X_2)	Difference scores (d)	(Difference scores)^2 (d^2)
< 20,000	41	10	31	961
20,000 – 40,000	101	91	10	100
41,000 – 60,000	95	103	-8	64
61,000 – 80,000	64	71	-7	49
81,000 – 100,000	54	62	-8	64
> 101,000	18	36	-18	324
Total	373	373	82	1562

Source: Field work data analysis, 2019

Table 11: Summary of student correlated t-test analysis

Categories	Number	Before (X_1)	After (X_2)	∑d	∑d^2	Sd	Sđ	Đ	t-value	Table value
Income	6	62.16	62.16	82	1562	9.40	3.85	13.66	3.54	2.015

Source: statistical computation from field work, 2019

Table 11 shows that calculated t-value of 3.54 which is higher than the table value of 2.015 at 0.05 significance level. The H_0 (null hypothesis) is rejected and the H_1(alternative hypothesis) is upheld. This goes to show that there is an improvement on the income level of the respondents after the road pavement.

Table 12: Student correlated t-test analysis of small and medium scale (SMS) business before and after road pavement.

SMS	Before (X_1)	After (X_2)	Difference scores (d)	(Difference scores)^2 (d^2)
General provision shops	45	59	-14	196
Tailoring shops	38	49	-11	121
Carpentry/wood work	18	23	-5	25
Welding/fabrication	9	13	-4	16
Hair dressing salon	31	38	-7	49
Restaurants/food vendor	8	28	-20	400
Computer/business center	4	8	-4	16
Private schools	3	7	-4	16
Vehicle/electronic repair	2	6	-4	16
Others	9	17	-8	64
Total	167	248	81	855

Source: field work data analysis, 2019

Table 13: Summary of student correlated t-test

Categories	Number	Before (X_1)	After (X_2)	∑d	∑d^2	Sd	Sđ	Đ	t-value	Table value
SMS	10	16.7	24.8	81	855	4.70	1.48	8.1	5.47	1.883

Source: statistical computation from field work, 2019

Table 12 above shows that the calculated t-value of 5.47 is higher than the table value of 1.883 at 0.05 significance level. The H_0 (null hypothesis) is rejected and the H_1(alternative hypothesis) is upheld. This shows that there is a significant increase on the number of small/medium scale business after the road pavement.

CONCLUSION AND RECOMMENDATION

The research study has shown that there is indeed a strong relationship between road network and socioeconomic development of any locality. With this it is believed that road is a key factor needed to drive sustainable development in developing economies. This shows that road infrastructure does not only increase accessibility alone but has a multiplier effect on the host communities where it passes through. Based on the result findings from the study, the following recommendations are put forward;

1. There is need for more road infrastructures in linking most of the isolated/rural communities
2. Construction of road should not be concentrated within urban centers but should be extended to the rural communities
3. There is need for constant monitoring and maintenance of the roads so as to consolidate on more socioeconomic benefits associated with road infrastructure.

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