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Road Transport Infrastructure and Inclusive Growth in Nigeria: A Study of Kaduna-Kano Federal Road

***Bobai[1],** Francis Danjuma, **Shuaibu[2],** Isa Mohammed, and **Njiforti[3],** P. Peter

[1]Department of Economics and Development Studies Islamic University In Uganda fdbobai@gmail.com
[2]Department of Economic University of Abuja-Nigeria mohammed_shuaibu@yahoo.com and
[3]Department of Economic Ahmadu Bello University of Zaria-Nigeria njifortica@yahoo.com

***Correspondent Author:** fdbobai@gmail.com: (+256 745 781 421 or +234 806 248 1407)

Abstract

This paper investigated the extent to which the construction of road infrastructure has resulted to inclusive growth in communities along the Kaduna-Kano Federal Road in Northwest Nigeria. Using multi-stage sampling techniques, the data used in this study came from questionnaires which were used to generate respondent's perception on sources of income as well as the influence of road transportation infrastructure on inclusive growth in four selected communities along Kaduna-Kano Federal Road. The choice of the four sampled communities was made because the development of the road passed through two of the communities (Kura and Jaji) while the development of road led to the development of Kafin-Maiyaki and Danmagaji communities. Interestingly, the results revealed that their sources of income were farming, trading, other economic activities, artisanship, and petty trading etc. It was further discovered that the road had facilitated economic activities, provided basic social amenities, increased income, improved welfare, and led to poverty reduction resulting to growth in the research area that is inclusive. The study recommended that government should give priority to road transport infrastructure development because it serves as a gate way to every community's growth and development and also acts as a strong economic agent that leads to inclusive growth.

Keywords: Road transport Infrastructure, Inclusive Growth, Binary logistic regression, Income generated, Facilitated economic activities, Improved welfare and Poverty reduction
JEL Code: R49, O49, C35, 139, D31, 131, 132

1.0 Introduction

Infrastructure is essential to maintaining economic growth in both developed and developing nations. It is the stock of capital used to support an economic system (Michael, 2016) and contributes to economic growth by increasing efficiency and providing facilities that improve welfare and productivity. What supports a transport system is infrastructure and it comprises of critical capital such as: road, rail networks, airports and seaports that facilitate transport operations, with multiplier effects on the economy. Indeed, the relationship between societal development and transport infrastructure is well established (Akhmetzhanoy & Lustoy,

2013; Rashidi & Samimi, 2012).[1]However, Sidiq (2019) opined that road infrastructure can be viewed as a means rather than an end in and of itself; this is consistent with the transport sector, which has been shown by economists to be a means rather than an end in and of itself, leading to the term "derived demand". One type of transport infrastructure that serves as a means to an end is road infrastructure.

According to Ng, et al.,(2019) who cited from the work of Meyer and Miller (2001) that road infrastructure is essential for facilitating mobility and easy transportation of people, commodities and services as well as providing access to land. It was observed that the construction of road infrastructure not only lowers the physical barrier but also promotes the flow of goods and services, enhances accessibility to social services and marketplaces, and helps to create jobs by cutting down on overall travel times and expenses. Saunders, et al., (2002); Aljoufie, et al., (2013) in two different studies stated that the development of road infrastructure like expressways can speed up and improve the efficiency of both domestic and international trade by reducing travel times and expenses; on the other hand, the development of high accessibility road infrastructure, like local roads, can facilitate easy land access and encourage social and commercial activity locally.

Thus, road transport infrastructure can promotes inclusive growth by generating additional jobs, stimulating economic activities and strengthening access to essential services like health care, education, and other necessities (Kingombe, 2017). The development of road infrastructure generally attracts commercial activity, which expands into a sizable market that stimulates trade and economic activity in most of the communities along the route. The communities along this route benefit from the creation of jobs as it increases their standard of living and income. However, since roads makes it easier for farmers to get their produce to market, most of rural hinterland rural areas normally benefit from the road infrastructure which attracts development of other feeder roads.

Therefore, the objectives of this paper are to analyse the respondents' perception regarding their main means of income in the research area, as well as investigate the extent to which the road infrastructure has resulted to inclusive growth in communities along Kaduna-Kano Federal Road. The research is divided up as follows: The second section looked at review

[1]The major role of transportation is to maximize speed and minimize cost in every society in such a way that goods and services can reach their finally destination in good time and at the least cost.

literature, theoretical framework, inclusive growth, and road transport infrastructure. The third segment included the methods for estimating the contribution of inclusive growth and road transport infrastructure. The results of our discussions are presented in Section 4. The conclusion and recommendations are included in the fifth and final section.

2. Literature Review

Some empirical studies have shown that paved road investments have been shown to yield an exceptional return on economic investment, particularly in nations with a deficiency of road infrastructure (Canning & Bennathan, 2000). Over 60% more has been produced in Sri Lanka's industries as a result of investments made in highway infrastructure (Gunasekera, et al., 2008). The benefits of constructing rural roads outweigh the costs of doing so, China's GDP has increased thanks to road construction, with the country's GDP now standing four times greater than that of high-grade roads (Fan & Chan-Kang 2008).

Roads play a crucial part in promoting the general development of low-income communities and regions by incorporating them into the mainstream economy through trade and investment. An efficient road transport system serves as a pre-requisite for sustained inclusive growth (Ighodaro, 2008). Similarly, China's manufacturing and service sectors' GDP shares have risen as a result of upgrades to its key regional and urban roadways (Ding, 2013). On the contrary, in some other related studies on road infrastructure and economic growth conducted by Jiwattanakulpaisarn, et al., (2009b); Banerjee, et al., (2012) revealed that economic growth is not significantly impacted by the expansion of road infrastructure. However Jiwattanakulpaisarn et al. (2009b) found little impact on employment growth in their study on the effects of highway infrastructure improvements in North Carolina counties, United States, from 1985 to 1997. Banerjee et al. (2012) discovered no significant impact on per capita GDP growth in their study on paved roads and highways in China spanning from 1986-1997.

Shruti and Vikash (2010); Pradhan, & Bagchi, (2013); Badalyan, Herzfeld, and Rajcaniova, (2014) discovered using the vector auto-regression model that the infrastructure for road transport has direct and indirect effects on the economy. In some other related studies conducted by Maiyaki, (2014); Alex-Onyeocha, et al (2015)**,** the highway transport infrastructure has shown that resources allocated and used for road infrastructure have been inefficiently utilized, thereby increasing the risk of desertion of road projects in Nigeria. In a similar study conducted by Pradhan and Bagchi (2013) in India, it was discovered that the construction of

roads can stimulate multiplier effect input on other sectors of the economy. Adedeji et al., (2014) affirmed that bad road conditions inhibit trade, manufacturing, and agriculture all have the potential to thwart progress. Nevertheless, this shortcoming was addressed by Bagchi and Pradhan, (2013); Noah et al., 2013; Prud'homme, 2005). Most of these studies failed to take the role of road transport infrastructure into account.

On the other hand, in terms of the four pillars of fairness, equality, justice, and political plurality, the African Development Bank (2012) defines inclusive growth as providing more people, regions, or nations with access to sustainable socioeconomic opportunities while also safeguarding vulnerable groups. The key indicators of inclusive growth in Africa are: inequality-adjusted; good governance pointer; economic diversification; infrastructure index; health; education; more number of women's involvement in the labour market and employment elasticity of growth. Ramos et al. (2013); Martins and Lucy (2013) affirmed that a number of important policy measures that supported inclusive growth in developing nations included addressing macroeconomic imbalances. In another related study Paramasivan et al. (2014) examined the paradigm shift to inclusive growth and discovered that it can create new economic chances by ensuring equal access to all in the society.

Ngepah (2017) stated that beyond outcomes, social opportunities particularly involvement in a society's economic processes have become a component of the discussion surrounding redistribution and inequality. Thus, inclusive growth strategy is supported by four major pillars: political, social, economic, and spatial inclusion, in line with Kayizzi-Mugerwa (2013). Other variables that were identified and are important contributors to inclusive growth in Nigeria include gender equality, infrastructure, governance, health, and economic diversification. The investment in road infrastructure must increase economic activity in order for growth to be inclusive. Alder (2016) examined the aggregate and distributional effects of transport infrastructure in India using the On-night lights satellite data. It was discovered that the real network led to large aggregate gains with an unequal effect across regions.

Claudia et al. (2016) examined how transport policies affect developing countries' growth, inclusivity, and sustainability. It was discovered that the transport policies have the potential to improve inclusive growth. Odongo and Ojah (2016) used generalized methods of moments to evaluate the relationship between infrastructure and economic growth in 45 Sub-Saharan African countries. It has been found that government spending on infrastructure affects economic growth

of each nation in Sub-Saharan Africa. Investments in road infrastructure can boost the economy through generating more jobs in the manufacturing and construction industries, improving connectivity, lowering transport costs, and minimizing the spoilage of perishable commodities. Road transport infrastructure boosts market efficiency by supporting poverty reduction in terms of initiatives aimed at developing human capital, including those related to health, education, and other vital infrastructure. The impoverished and lower middle class groups are expected to benefit from this.

*Puan et al. (2019) evaluated the factors influencing the mode of transport choice in Johor Bahru City. A random sample of 384 respondents participated in the stated preference survey. The binary logistic regression model was the procedure used for analysis. The findings from the results revealed that age, income, owning a car, comfort level in the automobile, bus service dependability, affective and instrumental motives, and other characteristics were found to be statistically connected with the mode of transportation choice in the research area.

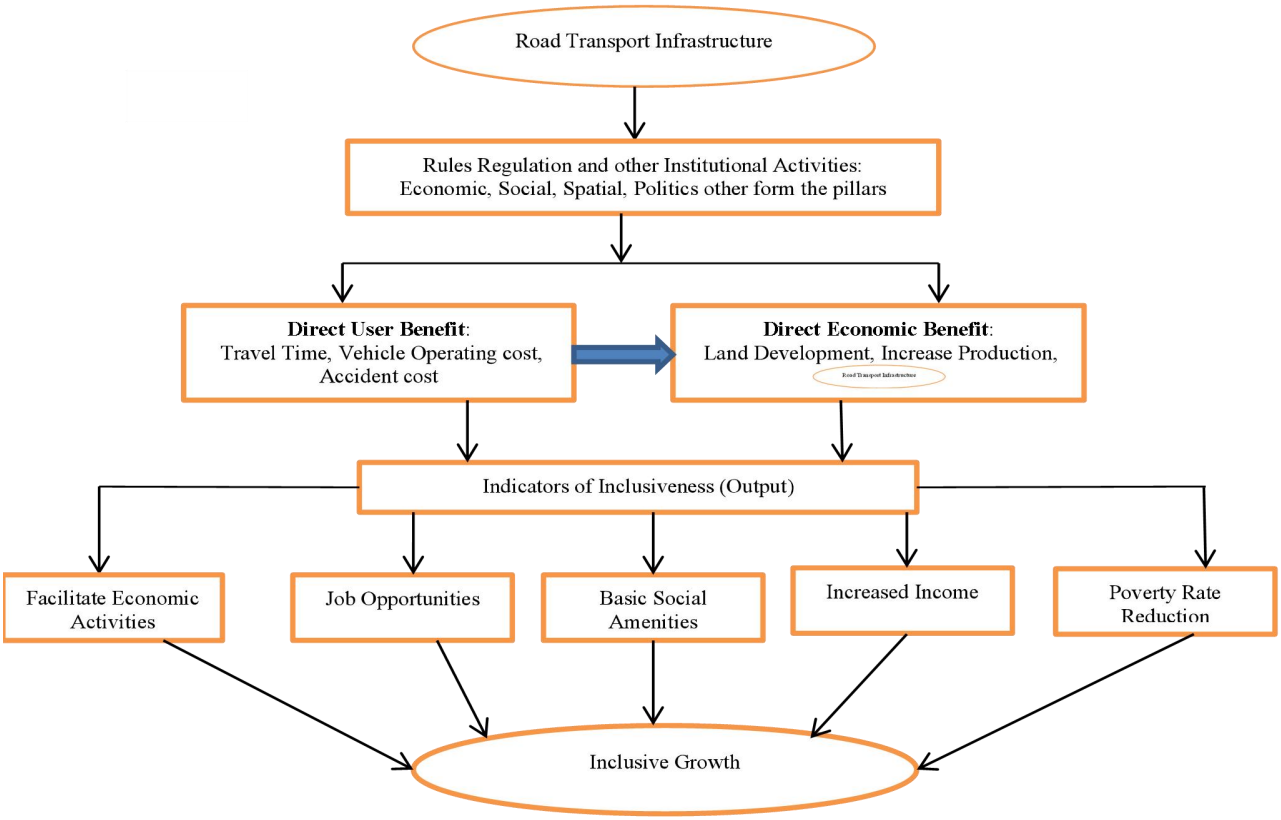
Ng et al. (2019) investigated how road infrastructure development affects economic growth and how other socioeconomic factors contribute to it. The time-series cross-sectional data from 60 countries was analyzed using fixed-effects panel linear regression analysis over a three-decade period, from 1980 to 2010. Major study findings showed that growth in road length per thousand population, per capita export, per capita education spending, and per worker's physical capital stock all positively correlated with economic growth.

In their study, Ogunseye, et al. (2020) investigated the socioeconomic consequences of Road Infrastructure Development (RID) in the Nigerian city of Abeokuta before, during, and after construction. The study used a multistage sampling technique, and the data were analyzed using both descriptive and inferential statistics. The development had a detrimental impact on the community's commercial activity, property value, travel time, and car condition, according to the findings. On the other hand, the t-test results indicated that there was a statistically significant difference in property value, commercial activity, public health, and transport expenses between the impacts that happened during and after construction. However, this study aims to close the gap by examining the relationship between inclusive growth and road transport infrastructure along the Kaduna-Kano Federal Road.

3. Materials and Methods

Conceptual Framework

The ability of road transport infrastructure to facilitate economic development depends on the joint impact and interaction of the rules and regulations as well as other institution activities, direct user benefit and direct economic benefit; with respect to the outcome of road transport infrastructure and its implication on the demographic change and growth which has a beneficial impact on the area of study. Figure 1 below provides a schematic link between inclusive growth and road transport infrastructure. It shows the channels through which infrastructure related to road transport affects inclusive growth. It also shows how road transport infrastructure provides accessibility to other areas so that movement of people and goods will be smoother, as well as reduction in transport cost which stimulates economic activities along the route. The rules and regulation transmit through economic, social, spatial, political and other forms of pillars, that have benefits on travel time, vehicle operating cost, and direct economic benefits on land development, increased production and reduced costs of doing business. This leads to relocation and agglomeration effect due to the presence of the road infrastructure which will then lead to indicators of inclusiveness (Output).



Sources: Adapted from AfDB (2012), Onakoya et al., (2012) and Anas et al., (2015).

The channel through which road transport infrastructure can transmit to inclusive growth can only be manifested through the indicators of inclusive growth (Economic development: Facilitated economic activities, Job opportunities, Basic Social Amenities, Increased Income and Poverty rate reduction). When road transport networks are effective in a society, they offer social and economic advantages and opportunities for settlements or communities that these roads pass through, leading to positive multiplier effects on market accessibility, employment, reduction in the cost of doing business, and additional investment. Furthermore, OECD (2021) stated that fairly distributed economic growth opens up opportunity for everyone in society. It also gives everyone a stake in the growth process. According to Anas, et al. (2015) the common approach in analyzing the road transport infrastructure's economic advantages on a particular route such as

Kaduna-Kano highway can be done in terms of microeconomic analysis. This approach is suitable for this study because it makes it possible to collect data from the field through direct responses from key stakeholders and shows how they have been affected due to the road infrastructure development.

3.2 Data Source and Sampling techniques

Questionnaires were used to generate respondent perception on the road transportation infrastructure development's effects on inclusive growth in four selected communities along Kaduna-Kano Federal Road. The choice of the four sampled communities used in this study was purposely done based on the fact that the development of the road passed through two of the communities (Kura and Jaji). On the other hand, the development of the road was done in the outskirts of Kwana-Dangora in Kano State and Wusasa in Kaduna State. This led to the growth and development of the two new communities Kafin-Maiyaki and Danmagaji which were basically farmland, with one or two houses. The development of the road led to significant improvement in most of the communities along the route as discovered from the interaction with the people during the reconnaissance survey conducted by the researchers. The multi-stage sampling method was used in this study. The choice of this technique was based on the fact that it provides adequate and consistent guidance at each stage as it progresses thus ensuring true representation. In accordance with Hannagan (1989) the three steps for selecting the sample size used is outlined as below;

i. There are 41 communities along the study area that were further stratified into four (two stratas each for communities in Kano and Kaduna). The stratification was by state rate-able value, (i.e. a community that the development of the road met and passed through and a community that was attracted by the development of the road) this is to ensure that the communities selected are representative of the entire communities in the study area.

ii. The communities selected were divided into four (4) districts, and two (2) districts from each state (Kaduna and Kano) were selected by stratified random sampling. In reference to the economic activities and spatial features along the study area, four communities (Jaji, Danmagaji, Kafin-Maiyaki, and Kura) were purposively selected in accordance with the multi-stage sampling. These

communities were selected because the development of the road attracted more socioeconomic benefits.

iii. 16 households were selected from each district by taking a systematic sample from the settlements in the study area.

The sample size from the multi-stage sampling (Hannagan, 1989) was calculated as follows: the total number of households selected which is 16 (household) x 4 (districts) x 4 (settlements) = 256.

3.3 Model specification

3.3.1 Qualitative Response Model

The logit model was used to determine the likelihood perception of the individuals in terms of income generated, how the road has facilitated economic activities, provided basic social amenities, increased income, improved welfare, and reduced poverty and its effect on inclusiveness. The impact of the individual's perception and involvement in economic activity on inclusive growth in communities along Kaduna-Kano route is of paramount importance to this study. To characterize the population ranges at which an event occurs, a regression model for binary response variables was employed. A randomly chosen subject's probability, p (y=1), is represented by the population fraction of successes. The values of the explanatory factors affect this probability in different ways. A binomial distribution, which is well-described for the dependent variable in Hollander and Wolfe (1973), Whittle (1976), Krzanowski (1998), Gujarati (2004), Spiegel et al. (2004), and Awogbemi and Oguntade (2012), is assumed by models for binary data that are dichotomous. In this study, the binary response model was used to estimate (or correlate) or investigate the degree to which economic activities in the study area has resulted in inclusive growth.

The logit model is specified as;

$$\log(P_i) = (\alpha_i X_i + \mu_i) \ldots \quad \ldots \ldots \ldots \ldots (1)$$

Equation (2) below is a log-likelihood function that shows the log-likelihood individual's inclusiveness in any economic activity that increased given the socioeconomic characteristics of X, where:

$P_i = 1$, if per inclusiveness is < Z and $P_i = 0$ if otherwise.

α_k = Vector of parameters to be estimated

X = Vector of explanatory variables (inclusiveness correlates)

Z = Inclusive growth along the study areas.

Thus the model is stated as,

$$ICG = \alpha_0 + \alpha_1 FEC + \alpha_2 BSA + \alpha_3 IWF + \alpha_4 INC + \alpha_5 RPV + \alpha_6 JOP + \mu_i \quad \ldots \quad \ldots \quad \ldots \quad (2)$$

Where, ICG is the inclusive growth benefit derived along the study area

ICG = Inclusive Growth (dependent variable).

FEC = Facilitated Economic Activities in the study area

BSA = Provision of Basic Social Amenities due to the presence of the road

IWF = Improved Welfare due to the presence of the road

INC = Increased Income due to the presence of the road

RPV = Poverty rate reduction due to the road

JOP = Job opportunities due to economic activities for areas along the road

α = coefficient of explanatory variables

μ_i= Error Term

α_0 = Constant intercept

$\alpha_1 - \alpha_8$ = Parameters

I = observation for each of the samples along the selected settlement in the study area.

i_1 = Jaji,

i_2 = Danmagaji

i_3 = Kafin-Maiyaki

i_4 = Kura

FEC = is dummy of individual respondent if facilitated economic activities lead to inclusive growth = 1, otherwise = 0.

BSA= is dummy of individual respondent if provision of Basic Social Amenities=1 otherwise=0.

IWF = is dummy of individual respondent if welfare is improved = 1 otherwise = 0

INC = is dummy of individual respondent if increased income = 1, otherwise = 0.

RPV = is dummy of individual respondent if reduction in poverty rate = 1, otherwise = 0.

JOP = is dummy of individual respondent if job opportunities = 1, otherwise = 0

In the model, $\alpha_1 - \alpha_6$ are expected to have positive signs indicating that a direct relationship exists amid road transport infrastructure and inclusive growth (ICG). If it is a direct relationship, this implies road transport infrastructure has led to inclusive growth. The results

was used to test the null hypothesis, which states that all slope coefficients are simultaneously equal to zero (i.e., $\alpha 1 - \alpha 6 = 0$). That is, the null hypothesis is rejected and vice versa when the likelihood ratio (LR) is higher than the probability value. The dependent variable is categorical or dichotomous in nature and it only takes the values of 1 for inclusive growth and 0 for otherwise. Going by the key implicit hypothesis of classical regression model which shows that the dependent variable is a continuous data, estimating equation (2) with OLS or any other classical linear regression framework will amount to breaching the continuous variable assumption. Thus, this could result in serious biasness of the magnitude of the impact on both the dependent and independent variables. Another danger of imposing any classical linear regression framework will be that of the regression estimate which is extremely sensitive to the range of particular values observed. Therefore, to avoid these problems as noted in Gujarati (2004), equation (2) should be estimated using a discrete choice model. It is in the light of these submissions that the logistic model was selected for this objective.

According to Gujarati (2004), three methods can be used to build a probability model for a binary answer variable: the linear probability model, the logit model, and the probit model. The probit and logit model can be generalized by defining the non-independent and identically distributed (non-iid) distributions. The difference in the two models basically is based on the distribution of the error terms being assumed. While errors in the probit model are considered to follow a normal distribution, errors in the logit model are expected to follow the usual logistic distribution. With regards to the probit case, the generalization typically employs the multivariate normal distribution, whereas in the logit case, it can take a number of forms, the most widely used theoretical foundations for these models is the additive random-utility model of McFadden (1973). The logit models are usually referred to as discrete choice models, which are frequently employed to simulate selecting among a range of exhaustive and mutually exclusive options. The assumption here is that the decision-maker chooses the alternative with the maximum utility among the set of alternatives. The utility function is used to determine the utility of an alternative, which is often made up of independent features of the alternatives concerned and other important parameters. The logit approach adopts the concept of random utility, implying that the actual utility of each alternative is seen as a random variable. It can be easily interpreted as a modeling log odd than the probit model.

4. Results and Discussion

The respondents' perceptions on the various types of economic activities that were used as sources of income in Kura, Kafin-Maiyaki, Danmagaji, and Jaji of the four sampled communities in the research route are displayed in Table 1 below.

Table 1: Economic Activity that Serves as Main Sources of Income in the Study Area

	Kura	**Kafin-Maiyaki**	**Danmagaji**	**Jaji**	**Total**
Petty Trading	12(15.8%)	6(8.2%)	6(8.6%)	7(9.6%)	31(10.6%)
Trading	16(21.2%)	16(21.9%)	21(30%)	13(17.8%)	66(22.6%)
Farming	25(32.9%)	23(31.5%)	8(11.5%)	15(20.6%)	71(24.3%)
Public Workers	5(6.6%)	3(4.1%)	2(2.1%)	3(4.1%)	13(4.5%)
Grazing	4(5.2%)	4(5.5%)	6(8.6%)	5(6.9%)	19(6.5%)
Artisan	7(9.2%)	7(9.6%)	8(11.5%)	12(16.4%)	34(11.6%)
Drivers	2(2.6%)	2(2.7%)	4(5.7%)	1(1.4%)	9(3.1%)
Okada Riders	3(3.9%)	2(2.7%)	2(2.1%)	2(2.7%)	9(3.1%)
Private workers	2(2.6%)	0	0	3(4.1%)	5(1.7%)
Others (Specify)	0	10(13.7%)	13(18.5%)	12(16.4%)	35(12%)
Total	76	73	70	73	292(100)

Source: Field Survey (2021)

According to the field survey result 24.3% (71) of the respondents stated that farming was their main source of income in the research area, while 22.6% (66) of the respondents stated that trading was the next largest source of income. However, 12% (35), 11.6% (34), 10.6% (31), 6.5% (19), 4.5% (13), 3.1% (9) 3.1% (9) and 1.7% (5) of the respondents stated that other economic activities, artisanship, petty trading, grazing, working as a public servant, drivers, and okada riders, were sources of income due to the road's passage through these communities. The study also found that as the road developed, there was a significant demand for goods and services as a result of people migrating to communities along the route, which increased the number of traders, as shown by the result in the table above.

Subsequently, the study also found out that the road development had a negative impact on farming activities by decreasing the hectares of land used for cultivation as stated by most of the respondents. As a result, the development of the roads increased demand for hectares of land used for other lucrative endeavors. Consequently, this further resulted to the value of land appreciating due to its high demand for urban build-up for both residential homes and economic

activities as result of increase population growth in communities along the study route, in accordance to (Bobai, 2023). Interestingly, it was also discovered that development of the road also had a positive impact on the income generated by most of those engaged in economic activities in the research area. This obviously shows that an efficient transport system is a prerequisite for inclusive growth and serves as a key infrastructure input in the growth process. The findings also validate (Elena & Susana, 2010) who stressed the importance of paying attention to explanations of revenue-generating activities of wage employed can be known by the kind of economic activities one is engaged in.

4.1 Result of Econometric Analysis

This part specifically analyzed the effect of Kaduna-Kano Federal Road on inclusive growth in communities. This was done using the logit model, where an index of income and expenditure is built as the dependent variable (if an individual earns > = ₦693.50, =1, and 0 otherwise). The data used here were obtained through a cross sectional survey from the following communities; Kura, Kafin-Maiyaki, Danmagaji and Jaji. The independent variables are activities that have influenced inclusiveness as a result of the development of the road which include: Facilitated Economic Activities (FEC), Basic Social Amenities due to the road (BSA), Improved Welfare of the respondents (IWF), Increased Income due the road (INC), Poverty Rate Reduction due to the road (RPV) and Job Opportunities due to the road (JOP). Below is the logit regression result of the entire study area.

Table 2 below, shows the effects of economic activities due to the development of the road and the effect it has on including the respondents in the growth process in the study area. Although not a direct equivalent, the Cox and Snell or Nagelkerke R^2 statistic in logistic regression is comparable to the coefficient of determination R^2 in linear regression. A rough estimate of the R^2 statistic in logistic regression is given in the model summary. The R^2 method proposed by Cox and Snell aims to replicate multiple R^2 by considering likelihood. According to the Cox and Snell R^2 results, the predictor variable, this is thought to be sufficient, accounts for 60% of the variation in the dependent variable.

Table 2: Logit Analysis of Inclusive Growthin the Entire Study Area

Variables	Coefficient	S.E.	Wald	Df	Sig.	Exp(B) (Odd ratio)	95% C.I. for EXP (B)		Remark
							Lower	Upper	

FEC	1.212	0.953	1.619	1	0.203	0.298	0.0466	1.925	> ICV
INC	2.791	0.669	17.415	1	0.000	16.298	4.394	60.453	> ICV
JOP	-0.199	0.740	0.072	1	0.789	0.820	0.192	3.497	< ICV
BSA	0.305	0.610	0.251	1	0.617	1.357	0.411	4.484	> ICV
IWF	1.893	0.937	4.080	1	0.043	0.151	0.024	0.945	> ICV
RPV	2.537	0.825	9.456	1	0.002	12.639	2.509	63.662	> ICV
Constant	-0.157	0.853	0.034	1	0.854	0.855			

Log likelihood	212.211	S.E of Regression	0.165
Cox & Snell R-Square	0.603	Prob (Value)	0.000
Nagalkerke R-Square	0.182	Odd ratio	5.791
Number of Observations	292		

Source: SPSS Version 23 out (2021)

* < ICV: Negative Coefficient indicates less likely to be Inclusive,

** > ICV: Positive Coefficient indicates more likely to be inclusive

From the result in table 2, it is noted that the 0.298 estimated odds ratio suggests that those whom the road has helped to facilitate economic activities (FEC) are 0.298 times more likely to be included in the growth process in the study area. It is evident that the route has contributed to an increase in economic activity that is significant across the entire area of study. The result revealed that more people from the study communities participated in different economic activities due to the presence of this road. Interesting, the estimated odd ratio of 16.298 revealed that increased income (INC) as a result of the road was 16.298 times more likely to include individuals engaged in economic activities in the growth process of the research area. It discovered that the road assisted in population growth as well as high demand for goods and services experienced in the study area with a multiplier effect on their sources of income.

Furthermore, the study area's provision of basic social amenities (BSA) as a result of the road was 1.357 times more likely to include individuals who were involved in economic activity in the growth process. According to this discovery, the road contributed to increase in the number of private healthcare facilities and educational institutions. Moreover, people whose welfare (IWF) the road has enhanced are 0.151 times more likely to be included in the growth process in the area of study. It also revealed that majority of them had their own homes, were able to pay for their medical expenses and children's tuition, among other things. Likewise, the

estimated odds ratio of 12.639 indicates that those whom the road has reduced their poverty (RPV) are 12.639 times more likely to be included in the growth process in the study route. It was discovered that most of them were engaged in productive economic activities which has significantly assisted in reducing the poverty level due to the route.

On the other hand, the calculated odds ratio of 0.820 shows that people who have had job opportunities (JOP) due to the development of the road are 0.820 times less likely to be a part of the growth process in the study area. This, however, runs contrary to the anticipated likelihood that the road has given local residents in the study area access to jobs. This is so because the majority of people involved in economic activity, whether directly or indirectly, have a job that supports their livelihood.

In summary, the estimated odds ratio result showed that the study route has facilitated economic activities, improved the daily income earned, resulted in the provision of basic social amenities, improved welfare, and reduced poverty for those involved in economic activities and majority of the respondents are more likely to be included in the growth process in communities along the study route. It can further be inferred that the route has a role in helping persons involved in economic activities participate in the growth process of the studied area. This finding implies, however, that the study route has brought about inclusive growth for those involved in economic activities. As a result, this result is consistent with findings from some of the literatures reviewed, including those by Ali and Son (2007), Elena and Susana (2010), McKinley (2010), Asian Development Bank (ADB) (2013), and Haan and Thorat (2013). Based to these studies, inclusive growth should to be able to achieve sustainable growth, which will ensure more access to opportunities by creating and expanding economic opportunities for society's members to take part in and benefit from growth.

5. Conclusion and Recommendation

The perception of the respondents on road transport infrastructure and its effect on inclusive growth was analysis. Perhaps, the key findings from the investigation showed that the road had a favorable effect on the sources of income of all those engaged in different economic activities. It further discovered that the route played a vital role in helping person involved in economic activity participate in the growth process in the study area. The implication here was that the route has brought about inclusive growth for those engaged in economic activities along the study area. In conclusion, this study revealed that road transport infrastructure has positively

assisted in attracting growth that was inclusive in nature for communities along Kaduna-Kano Federal Road.

The following recommendations were made; Firstly, Federal, State and Local government should give priority to road transport infrastructure development because it serves as a gate way to every community's growth and development and also acts as a strong economic agent that leads to inclusive growth. Secondly, it has been proven by development nations globally that transport serves as the backbone of economic growth. Since, development is drawn to road infrastructure of different economic activities which is a clear indication that no community, region or nation can survive without a sustainable transport. From this point of view, road infrastructure could be used to restructure the pattern of growth and development in communities by providing accessibility and mobility to goods and services for the best use of both human and natural resources.

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