

THE STATE OF RURAL INFRASTRUCTURE AND ITS EFFECTS ON CROP PRODUCTION IN VANDEIKYA LOCAL GOVERNMENT AREA OF BENUE STATE, NIGERIA

BENUE JOURNAL OF SOCIOLOGY
Volume 9 Issue 2
ISSN: ISSN: 0386
Department of Sociology
Benue State University, Makurdi
Pg: 187 - 202

Agnes Agbanugo Ikwuba, Andrew Ahwen Iorbee, Tavershima Abraham Agwaza & Ruth Iveren Angera

¹Department of Sociology, Benue State University, Makurdi.

²Institute of Food Security, Federal University of Agriculture, Makurdi.

³Centre for Food Technology and Research, Benue State University, Makurdi.

Abstract

This study was an assessment of the state of rural infrastructure and its effects on crop production in Vandeikya Local Government Area of Benue State. Specifically, the study examined the available rural infrastructure that enhance crop production, evaluated the condition of these rural infrastructures and assessed the effects of deplorable rural infrastructure on crop production. The study adopted Walt Whitman Rostow's Modernisation Theory of Economic Growth to explain the subject under investigation. Cross-sectional design was employed for the study. A sample of 400 crop farmers was drawn for the study using multistage sampling procedure. Data was collected using questionnaire and key informant interview and analysed both quantitatively and qualitatively. Findings revealed available infrastructure in the study area as access roads and bridges (40.8%), transport facilities (22.2%), farm inputs/machines (19.2%), and credit facilities (17.8%). The findings further indicated that the state of available rural infrastructure in the area was deplorable ($p < 0.05$), which has affected crop production ($p < 0.05$) by reducing the rate of production, increasing post-harvest losses, inducing rural-urban migration and criminality in the area. The study recommended that Federal and State governments should consider rural infrastructure especially access roads/bridges construction and repairs paramount to enhance crop

Corresponding Author:
Andrew Ahwen Iorbee
Email: iorbeeandrew@gmail.com

production. Private and cooperate organisations should assist farmers with soft loans which should be disbursed directly and timely to enable them meet their farm needs at the appropriate season. Farm inputs/machines should be subsidized either by government or private sectors to enable farmers afford them to advance crop production, among other recommendations.

Keywords: State, Rural Infrastructure, Effects, Crop Production, Vandeikya LGA

Introduction

Infrastructure is described as a key foundation for strong economic growth that ensures efficient operations in crop production (International Labour Organisation, 2010). These infrastructures are classified into hard and soft. Hard infrastructure are the physical facilities around our geographical environment that facilitate our daily activities such as roads, electricity, water, industries, storage facilities, processing and preservation amenities, to mention these few. Whereas soft infrastructure are institutions that are required to maintain the economic, health, cultural and social standards of a country, such as education, health, credit facilities and security (Boyle, 2022). This study focused more on hard infrastructure with concentration on the physical infrastructures such as roads, electricity, water, transportation, storage and processing facilities. Thus, increasing crop production depends on availability and good state of infrastructures.

Crop production is instrumental in social and economic activities of countries all over the world. The World Food Summit held in Rome in 2009 served as an important opportunity in reiterating the fundamentals of crop production. According to the resolutions reached by the Heads of Nations at the summit, the global food insecurity problems (most especially in developing countries) could be properly addressed by giving due attention to agriculture (Egbuna, Aiyewalehinmi, Louis et al., 2013). Crop production enhances Gross Domestic Product (GDP), provide food and raw materials for industries, employment for the populace and reduce poverty (Ogen, 2007; Bello, 2020). Crop production serves as a source of livelihood, marketable surplus; contribute to foreign exchange resources, revenue and economic development.

The relevance of infrastructure to crop production is not only an important driver for Total Factor Productivity (TFP) growth, but also directly contributes to a substantial reduction in rural poverty. It adds to an improved infrastructure which leads to high crop production and expansion of markets. Besides, it opens up the rural economy to greater competition from outside (Singh, 2003). De and Ghosh (2008) ascertained the positive and significant relationship between the level of infrastructure and per capital net domestic products. Also, infrastructure improvement and dissemination of technology contribute to improved crop production. The cross-country as well as global empirical studies have established the linkages between infrastructure development and sustained crop production output growth (Munyanyi, n.d.; Edeme, Nkalu, Idenyi et al., 2020).

However, a look at the situation of infrastructures in most developing countries shows that the necessary infrastructures that should be a channel of encouragement for the farmers are almost a mirage or completely decayed. Udoh (2005) disclosed that over two-thirds of Nigeria's population resides in rural areas, where crop production prevails and over 100 million Nigerians still lack access to adequate infrastructures, less than 40% have access to safe drinking water. According to Alabi and Ocholi (2010), Nigerian roads were described as the lowest in density in Africa, where only 31% of the roads are tiled as compared to 50% in the middle income countries, and even where roads are provided, only 40% of these roads are in good condition.

World Bank (2011) reported that poor infrastructure reduces crop production by 32% and the amount of grains losses in sub-Saharan Africa amounts to US\$4bn each year, which in turn is more than the amount of annual food aid received in the region and equivalent to the annual caloric requirement of 48 million people. The African Postharvest Losses Information System (APHLIS) estimates that between 10% and 23% of total cereal production goes to waste in Africa. Of this, 2%-5% is due to farm storage, 1%-2% occurs during the transport to the market phase and a further 2%-4% goes to waste in the market storage facilities (Oke, 2016). From these statistical reports, it is necessary that unless something is done to control the negative effects of infrastructures on crop production, else it

will intensify the rate of food shortage globally, continentally, Nigeria as a whole and in the study area to be precise. Consequently, this study evaluates the state of rural infrastructure and its effects on crop production in Vandeikya Local Government Area of Benue State. Specifically, the study examines the available rural infrastructure that enhances crop production, evaluates the condition of these rural infrastructures and assesses the effects of deplorable rural infrastructure on crop production in Vandeikya Local Government Area.

Hypotheses

- i. Rural infrastructure is not significantly related to crop production in Vandeikya LGA.
- ii. Deplorable condition of rural infrastructure does not significantly affect crop production in Vandeikya LGA.

Theoretical Framework

The study adopted Walt Whitman Rostow's modernisation theory of economic growth to explain the state of rural infrastructure and its effects on crop production in Vandeikya LGA of Benue State. According to Rostow, all societies pass through five stages of economic development. These stages are; (i) traditional society, (ii) preconditions for take-off, (iii) take-off, (iv) drive to maturity, and (v) mass consumption. Developing countries must pass through these stages to develop (Agwaza, 2021, pp.99-100). Rostow maintained that these stages must be observed appropriately. Once that is done, there will be significant development. Increases in crop production can increase economic growth and stimulate production; the level of increase in crop production may be slowed down if there are inadequate infrastructural facilities like roads, electricity, transport, water and storage facilities. For growth in crop production to take place, societal evolution, inventions and innovations must be encouraged.

The theory argues that developing countries lack infrastructural facilities; the technology with which to transform their backward societies. Neither do they possess the mental skills required to exercise control over their material environment for development to occur. The theory opined that farmers are constrained due to the traditional nature of the society.

Pointing to their use of crude tools such as hoes, cutlasses and axes, lack of storage/processing facilities, high illiteracy rate, lack of access to modern information, lack of access to funds which surround the farming practice, causing low crop production.

Generally, the theory sees developing countries as living in a natural state, which makes it difficult for them to develop. The theorists have suggested as a major remedy the diffusion of capital from the western nations to the developing countries to improve infrastructure to facilitate crop production since it is the life wire of development. They also assume that western values and institutions are development-oriented and there is need to transfer these from the west to developing countries by cultural assimilation for development.

This theory becomes relevant and related to this study because, the quest for food by man via crop production led to transition of human societies from one form to another and other inherent changes like division of labour, specialization, urbanization and civilization emerged in these new societies as a result of man's search for food. On this note, it is expected that if developing nations can evolve through the five stages of economic development as suggested by Walter Whitman Rostow's, there shall be development in developing countries, Nigeria, Benue State and Vandeikya Local Government Area in particular in terms of improved rural infrastructure and increased crop production.

Methodology

Cross-sectional design was adopted to gather relevant information from the respondents on the state of rural infrastructure and its effects on crop production in Vandeikya LGA of Benue State. The area was favoured for survey because of its mass crop production. The population comprised of all crop farmers domiciled in the area. The sample of 400 crop farmers was determined using Taro Yamane (1967) formula. Consequently, multi-stage sampling procedure was used to select respondents for the study. Questionnaire and key informant interview methods were employed to collect data from the respondents. Data collected through these methods were analyzed both quantitatively and qualitatively. The study hypotheses were tested using correlations statistics.

Results and Discussion

Available Infrastructure that enhance Crop Production in Vandeikya LGA

Table 1: Respondents' responses on the available infrastructures

Available Infra structural Facilities	Frequency	Percent
Access roads and bridges	151	40.8
Transport facilities	82	22.2
Farm inputs/machines	71	19.2
Credit facilities	66	17.8
Total	370	100.0

Source: Field Survey, 2021.

Table 1 presented data on available infrastructures in the study area by respondents. The result shows that, 41% (151) of the respondents identified access roads and bridges as the major available infrastructural facilities in their area although the situation of the roads are unpleasant for them to bear. Means of transportation such as scramblers, motorcars and trucks was indicated by 22% (82) of the respondents as another available infrastructure in the area. Other available infrastructures are farm inputs/machines with 19% (71) respondents while credit facilities recorded 18% (66) respondents respectively. From the above result, it was deduced that the most common and available infrastructures in Vandeikya LGA were access roads and bridges although they were in a deplorable condition despite the fact that they were available. This finding corroborated the position of key informants.

According to a 38 year old Female Farmer from Mbaataan, Mbadede Council Ward:

...the only accessible infrastructure facility that helped me take my harvested crops to the market is Bajaj, because most of our roads here are bad and therefore drivers cannot risk bringing their cars to transport our goods to the market, so we convey them on Bajaj to markets like Ihugh, Agbo and Tsar (Source: KII, 2021).

A 34 years old Male crop farmer from Mbaur, Mbagbera Council Ward in an interview responded:

...road are available, some are good, especially from Atser Branch through Agbo to Tsar-Mbaduku, although the interior roads are bad full of gulleys'.... (Source: KII, 2021).

From the above discussion, it is clear that the most conspicuous infrastructures in Vandeikya LGA of Benue State are roads and transport facilities. Apart from the aforementioned, others may have existed but are located in urban-like settlements such as Ihugh, Vandeikya town and Tsar. Despite the fact that roads infrastructure constitute the highest frequency, it was observed that most of the roads were constructed by the people and untarred with some having local bridges constructed with wooden planks which can be easily eroded during heavy rainfall. These roads ease both human and vehicular movement. And apart from the fact that access roads help in the transportation of crops from the farms to markets, they also increase local trade and productivity, reduce transportation costs of farm input and output, and reduce post-harvest losses of perishable crops. They connect farms and coastal areas to main roads, hence promoting agro-tourism. Access roads also contribute to economic development and growth and bring important social benefits. Roads open up more areas and stimulate economic and social development. This finding agrees with Adeleye (2005) who maintained that road is a way for movement between places, and designed to accommodate many vehicles applying from both directions. Roads link farmers to and from their farms for agricultural activities and markets for purchase of farm inputs or sell of their farm produce, the rural areas that engage in farming activities that forms the foundation for the economic development needs good roads, despite the relevance of road to crop production, farmers who dwell in the rural areas have limited access to good roads, instead most of the rural roads little or no attention is paid to them whereas they are needed to enhance crop production.

The result also sees transportation means as the second fundamental infrastructure present in the area although insufficient, because it help or facilitate their movement from one destination to the other. It also helps for

conveying farm inputs from various destinations to the farm and vice versa. Therefore it is also significant but not all farmers can afford a motorcycle to assist as means of transportation to facilitate crop production. This finding agrees with African Development Bank (2009) which established that transport is an indispensable element of development and socio-economic growth. As engines of economic integration, transport services facilitate crop production.

However, for infrastructures to have direct impact on the crop farmers they must be situated where these farmers resides. This will enhance crop production, reduce post-harvest losses and also improve the living standard of the farmers. It is discovered that despite the relevance of the rural areas in crop production, the available infrastructures such as roads, credit facilities, transportation means and farm inputs are available but in an abysmal state.

Condition of Rural Infrastructure in Vandeikya LGA

Table 2: Respondents' response on the condition of infrastructure in the study area

Condition of infrastructural facilities	Frequency	Percent
The roads are full of gulley, pot holes and un-tarred	123	33.2
Faulty and insufficient transportation means	86	23.2
Scarcity of funds and difficulty to access credits	60	16.2
Farm inputs are substandard quality and inadequate	57	15.4
Farm machines are faulty also malfunctioned	44	12
Total	370	100

Source: Field Survey, 2021.

Table 2 presented data on the state of infrastructural facilities in Vandeikya LGA by the respondents. The information gathered in the table indicates that, access roads have gulley, full of pot holes and untarred according to 33.2% (123) of the respondents which constitute the highest frequency, 23.2% (86) of the respondents said that there is faulty and insufficient transportation means to convey input/output to various destination, 16.2%

(60) of the respondents said that there is scarcity and difficulty on credit accessibility, 15.4% (57) of the respondents said that farm inputs are inadequate and of substandard quality, while 12% (44) of the respondents said that farm machines are faulty and malfunctioned. From the above result, it is deduced that despite the fact that other facilities too are in a bad condition, 33.2 % with the highest population of respondents indicates that the roads are full of gully and pot holes. This finding corroborated the position of key informants.

According to a 51 year old Female farmer from Mbakijime, Mbakaange Council Ward:

... we don't have farm machines like power driller neither planters even agro chemical to use on our farms we don't have access to, that has affected us, depriving us from expanding our farm size... (Source: KII, 2021).

According to a 36 years old Male farmer from Bako, Ningev Council Ward:

...If the government wants to help us they should buy motorcycles like Bajaj, Boxer and Honda bikes for effective agricultural activities. Also, we don't use to see extension agents to educate us on new technology again, also fertilizer that we use to access they have stop even if you see it the price will be very high, therefore once you don't apply fertilizer you end up with poor yield... (Source: KII, 2021).

From the above findings, it was discovered that the condition of infrastructures in Vandeikya LGA were in a deplorable state. The study revealed that the rural roads are very bad; most rural roads are untarred and they are full of pot holes, they were also washed away by erosion. However, it was noticed that roads construction is very expensive and most of rural farmers are not financially buoyant to construct or repair these roads, they only resolve to fill the pot holes with sand yearly. This finding agrees with the Nigerian Editorial Board (2015), that the deplorable state of roads in Nigeria has certainly become a national shame and an unnecessary embarrassment

as there is hardly any part of the country that can boast of motorable roads. Alabi and Ocholi (2010) added that the Nigerian roads were described as the lowest in density in Africa, where only 31 per cent of the roads are tiled as compared to 50 per cent in the middle income countries and even where roads are provided, only 40 per cent of these roads can be said to be in good condition which is still insignificant, the situation is worse on local roads because they are left unrepaired for a long period of time, 70 per cent of the roads are not vehicle worthy. They also reveal that recent reliance of Nigeria on its road scheme increases the urgency of addressing the situation of bad roads, except roads are kept in good conditions, if not the desired socio-economic development and food security agenda of the country will not be achieved and there will be drastic decline in crop production, and food scarcity in the nation.

The second infrastructure to roads was transportation means, and they were faulty and insufficient, even the once available were in bad condition which poses difficulties in using them to convey farm inputs and output to various destinations. The study also discovered that farm input supply in the area is in abysmal situation as they hardly access them from either government or private entities. Although, several appeals have been made by the people calling on the relevant authorities to come to their aid but yet the result is fruitless. The worse issue is that even when there is little supply of these inputs, those in charge will channel them to their relatives depriving farmers from having access to the farm inputs thus, bringing more harm in the agricultural section and crop production in particular. Furthermore, farm machines like drillers, planters, harrows are also not accessible. The government no longer provide for farmers.

It was also discovered that, credit unaccessibility is another major challenge face by the people because the condition is not friendly. For farmers to access credit from government is a very difficult task, even if there is an opportunity only insignificant percent will have access to and it will be based on nepotism. In most cases the actual farmers may not have such privilege. Also, when it comes to private organisations or local contributions, the interest rate will be too high such that they cannot be successful with the credit or loan, and this has caused a great effect to farmers leading to low crop production. On this note, something need to be done to increase the

condition of infrastructure in the study area to enhance crop production, control post-harvest losses and maintain food security to improve the current economic condition in the area and Benue State at large.

Effects of Deplorable Rural Infrastructure on Crop Production in Vandeikya LGA

Table 3: Respondents' responses on the effects of infrastructure on crop production

Effects of infrastructure on crop production	Frequency	Percent
Increase poverty and food insecurity	90	24
Decline in crop farmers population and rise in rural-urban migration	80	22
Reduces farm yield and farmers income	75	20
Increase in cost of transportation	50	13
Increase rate of criminal activities	28	8
Neglect of crop production activities	25	7
Decline in economic growth	22	6
Total	370	100

Source: Field Survey, 2021.

Table 3 presented data on effects of infrastructures on crop production by the respondents. The effects were reported in the following order: increase poverty and food insecurity as indicated by 24% (90) of the respondents which mark the highest percentage, 22% (80) of the respondents noted that there was decline on crop farmers' population and rise in rural-urban migration, according to 20% (75) of the respondents, there was reduction in farm yield and farmer's income. Other effects of infrastructure on crop production as observed by the respondents were increase in cost of transportation as specified by 13% (50) of the respondents, also 8% (28) of the respondents identified increase in the rate of criminal activities as effect of infrastructure on crop production, 7% (25) of the respondents identify neglect of crop production activities as the effect, while 6% (22) of the respondents said that there was a reduction in economic growth. The result implies that the deplorable state of infrastructures have tremendous effects on crop production as it increase poverty level of the farmer and food insecurity. Thus, Gajigo and Lukoma (2011) asserted that effects of

infrastructure on crop production are massive. They maintained that the basic tool that assists boost agriculture production in any part of the country is favourable infrastructures. In a situation where infrastructures are available and accessible, crop production will be on the increase. This is because farmers will be encouraged to see farming as a profit oriented activity or business. They further argued that this will help in reducing hunger, poverty and over dependence on the government. They also maintained that deplorable infrastructures will be disastrous to agricultural productivity, crop production to be specific and the nation's economy generally.

Discussions during key informant interviews (KII) across the sampled wards were mostly hinged on reduction in crop yields as well as income. The key informants lamented that because they lack basic infrastructures such as access roads and bridges, credit facilities; good means of transportation, and farm inputs and machines, they could not produce as is expected of them.

The study discovered that the economic potentials of Vandeikya LGA lie in addressing the severe infrastructure deficit, specifically with regards to crop production. The state of roads and credit facilities in the area pose a significant hurdle for farmers. The dire state of the local government roads result in a substantial proportion of crop production never reaching the end user. The study also discovered that the amount of crop yield reduction in the area is high because many people no longer have the interest of farming due to challenges of infrastructure. It further explained that poor conditions of the roads also affect the transport price of agricultural products. Poor roads condition affects better access to wider market, increase losses and delays in moving the farm produce. This in most cases makes the produce to reach the market late, in bad condition, poor quality and at a very high transport cost which therefore attracts low income to the farmers.

The study also discovered that lack of farm machines have affected the spate of farming. This has made farmers to produce on a small scale due to inadequate human labour. The cost of farm machines is expensive and majority of the farmers cannot afford them. This finding is supported by Akinyosoye (2010), who maintained that infrastructure is the basic equipment and structure that are needed for a country, region, or

organisation to function properly. He argue that, infrastructure contribute to the economic development by increasing productivity and providing services, which enhance the quality of life. He further maintained that failure to put these infrastructures on ground most especially in the rural areas may result to ineffective crop production, increase cost of transportation, small farm size, poor yield, limit the uses of local markets and discouraging agricultural activities which may lead to food insecurity.

Hypothesis Testing

Two hypotheses were tested at 0.05 level of significance using correlations statistics.

Hypothesis One: *Rural infrastructure is not significantly related to crop production in Vandeikya LGA.*

Table 4: Correlations for Linear Relationship between rural infrastructure and crop production

Variable	N	\bar{X}	SD	df	R	Sig.
Rural infrastructure	370	2.30	1.29			
Crop production	370	4.27	2.78	368	.939	.000

The result in Table 4 showed that rural infrastructure is statistically related to crop production. This is because the significance level (.000) is less than 0.05. The value of .939 implied that there is a positive correlation between rural infrastructure and crop production. Therefore, the hypothesis which states that rural infrastructure is not significantly related to crop production in Vandeikya LGA was rejected. This means that, rural infrastructure is significantly related as it enhances crop production in Vandeikya LGA.

Hypothesis Two: *Deplorable condition of rural infrastructure does not significantly affect crop production in Vandeikya LGA.*

The result in Table 5 showed that the deplorable condition of rural infrastructure is statistically related to crop production. This is because the significance level (.000) is less than 0.05. The value of .971 implied that there

Table 5: Correlations for Linear Relationship between Condition of rural infrastructure and Crop production

Variable	N	\bar{X}	SD	df	R	Sig.
Deplorable condition of rural infrastructure	370	3.10	1.81			
Crop production	370	4.27	2.78	368	.971	.000

is a positive correlation between deplorable condition of rural infrastructure and crop production. Therefore, the hypothesis which states that deplorable condition of rural infrastructure does not significantly affect crop production in Vandeikya LGA was rejected. This means that, deplorable condition of rural infrastructure significantly affects crop production in Vandeikya LGA.

Conclusion

Deriving from the results and discussion, the study established that available infrastructures in Vandeikya LGA are access roads and bridges, transport facilities, farm inputs/machines and credit facilities, and these infrastructures are in a deplorable state or condition. This has therefore affected crop production in the area by reducing the rate of production, increasing post-harvest losses, inducing rural-urban migration and causing food insecurity and criminality in the area. Hence, the need for drastic measures to improve on these rural infrastructures for enhanced crop production in the area.

Recommendations

The study therefore recommends as follows:

- i. Federal and State governments should consider rural infrastructure especially access roads/bridges construction and repairs paramount to enhance crop production, reduce post-harvest losses and rural-urban migration.
- ii. Private and cooperate organisations should assist farmers with soft loans, which should be disbursed directly and timely to enable them meet their farm needs at the appropriate season.
- iii. Farm inputs/machines should be subsidised either by government or

- private sectors to enable farmers afford them to advance crop production.
- iv. Philanthropists and NGOs should also assist farmers with motorcycles or trucks to avert the challenge of transporting farm produces.
 - v. Government need to address the issue of inadequate Agricultural Extension Services so that farmers will adopt new technology and add to their experiences.
 - vi. Opinion of crop farmers should first be sort on critical rural infrastructure that will enhance productivity in the area before such facilities are established.
 - vii. Community members should be well enlightened on how to use and manage/handle infrastructures in their vicinity to prevent untimely damage.

References

- African Development Bank (2009). *Infrastructure investment in Africa*. Research Brief.
- Agwaza, T. A. (2021). *Effects of post-harvest losses of orange on the production and income of farmers in Agricultural Zone A of Benue State, Nigeria*. A PhD thesis submitted to Postgraduate School, Benue State University, Makurdi – Nigeria.
- Akinyosoye, M. (2010). Infrastructural development in Nigeria: Road map to sustainable development. <http://greenhillts.com/>
- Alabi & Ocholi (2010). Infrastructure and poverty. Programme, U. N. (2011). Infrastructure for Economic Development and Poverty Reduction in Africa.
- Bello, M. (2020). Economic importance of agriculture for poverty reduction in Nigeria. In Leal F. W., Azul, A., Brandli, L., Lange S. A., & Wall, T. (eds.) *Decent Work and Economic Growth* (pp.1-11). Encyclopedia of the UN Sustainable Development Goals. Springer.
- Boyle, M. J. (2022, July 14). Infrastructure: Definition, meaning and examples. www.investopedia.com/terms...
- Bulus, J.S., & Adefila, J.O. (2014). The study of rural infrastructural facilities in Kajuru area, Kaduna state of Nigeria: A spatial analysis for planning.

- International Journal of Humanities and Social Science 4(2):286-295.
- De, P., & Ghosh, B. (2005). Effects of Infrastructure on Regional Income in the Era of Globalization: New Evidence from South Asia. *Asia-Pacific Development Journal*, 12 (1): 81-107.
- Edeme, R. K., Nkalu, N. C., Idenyi, J. C., & Arazu, W. O. (2020). Sustainable agricultural output and employment in ECOWAS countries. *Sustainable Futures*, 2, 100010.
- Egbuna, C. K., Aiyewalehinmi, E. O., Louis, I. A., & Agali, I. (2013). The role of engineers in agro-industrial development in Nigeria. *Educational Research*, 4, 340-344.
- Fan, S., & Chan-Kang, C. (2005). Road Development, Economic Growth, and Poverty Reduction in China. International Food Policy Research Institute Research Report 138.
- Federal Government of Nigeria, (2016). Draft National Transport Policy August, 2010
- Gajigo, O., & Lukoma, A. (2011). Infrastructure and Agricultural Productivity in Africa, AfDB.
- International Labour Organization, (2010). Investments in infrastructure: an effective tool to create decent jobs. ILO policy brief 01.
- Kumar, D., & Amrit, P. (2005). Infrastructure for Agriculture & Rural Development In India. ICFAI Journal of Infrastructure. Available at <http://129.3.20.41/eps/urb/papers/0506/0506002.pdf>. Accessed on March 4, 2012.
- Munyanyi, W. (n.d). Agricultural infrastructure development imperative for sustainable food production: A Zimbabwean Perspective. *Russian Journal of Agricultural and Socio-Economic Sciences*, 12(24), 13-21.
- Oke, D., (2016). "Physical Infrastructure as a Constraint on Agricultural Growth: The Case of Sub-Saharan Africa," *Oxford Development Studies*, 24 (3): 189–219.
- Rostow, W. W. (1962). The process of economic growth. 2nd Ed. Oxford University Press.
- World Bank (2011). *World development indicators*. Washington, D.C.: World Bank.
- World Bank (2013). *A survey of Infrastructural Indicators in Africa*. Washington D.C.