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Effects of Rural Infrastructural Development on Agricultural Productivity in Northern Taraba State, Nigeria

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ABSTRACT

This study examined the effect of rural infrastructural development on agricultural production in Northern Taraba State, Nigeria. The objectives included describing respondents' socio-economic characteristics, assessing the availability of basic rural infrastructure for agriculture, evaluating infrastructure's impact on farming activities, and identifying barriers to infrastructural development. Multi-stage sampling methods were used to select 120 respondents, with data collected via structured questionnaires. Data analysis involved descriptive statistics and logistic regression. Results showed that 52.5% of roads were tarred, with primary transport facilities being motorable roads (67.5%). The average distance to a motorable road was 3.6 km. health facilities, general hospitals (46.7%), primary health centers (36.7%), and private hospitals (10%) were available, with an average distance of 11.4 km to the nearest health facility. Water sources included rivers/streams (35%), boreholes (25%), and open wells (18.3%), with an average distance of 1.6 km. Educational facilities comprised primary schools (47.5%), adult education centers (20.8%), and secondary schools (10%), while periodic markets (70.8%) served as primary marketplaces, approximately 8.7 km from farmers' homes. About 54.2% reported access to financial institutions, mainly micro-finance banks (32.5%), commercial banks (31.7%), and non-interest banks (15.8%). Farmers primarily sourced credit from micro-finance and non-interest banks. The analysis indicated that roads, schools, and potable water significantly influence agricultural productivity. Major barriers include government corruption (mean=3.0), political instability (mean=2.9), and high costs of infrastructural materials. The study recommends that farmers form community self-help groups to contribute funds or collaborate with government agencies to improve rural infrastructure, thereby enhancing agricultural productivity.

Keywords: Rural Infrastructural, Development, Agricultural Productivity, Northern Taraba State

INTRODUCTION

The contribution of rural infrastructure to the economic advancement and development of a nation can never be over-emphasized. Given the state of rural infrastructure facilities in Africa, this issue remains one that needs serious deliberation. Rural infrastructure in Nigeria remains inadequate to meet ever-increasing industrial need, the agricultural sector and the fast-growing population (Omotoso *et al.*, 2022). In addition, various performance indices in respect of these infrastructural facilities pinpoint that they are underutilized and their performance remains unsatisfactory (Otieno, 2020).

Rural infrastructure has enormous importance for the economic advancement of a nation. The relationship between rural infrastructure elements such as roads, transportation networks, portable water and primary health centres and enhancing agricultural output can never be fully quantified (Omotoso *et al.*, 2022). Its availability contributes to increases in agricultural activities and in the standard of living of the populace (Maja & Ayano, 2021). The poor state of rural infrastructure facilities in rural societies has a direct negative impact on the sustainability of rural societies and their agricultural activities, while exacerbating this poverty (Kaiser & Barstow 2022; Woodhill *et al.*, 2022). In Nigeria, the focus of government investment has been on road construction, health, education and water supplies in urban areas, while little attention has been paid to rural infrastructure development (Owigho *et al.*, 2023).

The state of disrepair of rural roads causes inadequate market surplus and timely delivery of goods to the market, and frustration of smallholder agriculturists in sourcing storage facilities, farm tools and advanced technology. Therefore, farm yields will definitely be low and unpalatable due to the inadequacy of storage facilities and lack of processing equipment, which are real constraints in agricultural productivity in many parts of the country. A study by Omotoso *et al.* (2022) revealed that roads to villages where the poor live are virtually inaccessible and in a state of disrepair during heavy rainfall. The poor state of roads leading to rural areas is the

determining factor affecting the development of the rural society of any nation. Rural people face series of problems such as inaccessible health facilities, inadequate portable water and education opportunities. The situation is further worsened because government is busy developing urban areas at the expense of rural communities, which are the food basket of the nation (Ye *et al.*, 2023).

Zubair (2022) reported that the majority (51.7%) of Nigerians lives in rural areas and agriculture is their major source of livelihood, while the remainder of the population (48.3%) constitutes urban dwellers. Agriculture is a prominent industry and serves as source of labour in Africa (McMillan & Zeufack, 2022). Improvements in agricultural activities will have a significant impact on food availability and poverty alleviation, as well as on the general transformation of the nation at large. It is scientifically clear that the availability of rural infrastructure is necessary for improved agricultural production. There is no available literature to show the present status of infrastructure and its effect on Agriculture in the study area. In light of this, this study examines the effect of rural infrastructure on agricultural production in Northern Taraba State. It specifically identifies available basic rural infrastructure necessary for agricultural production; examine the effects of basic rural infrastructure on the production activities of the farmers; and ascertains the factors hindering infrastructural development in the study area.

METHODOLOGY

The Study Area

This study was conducted in Northern Taraba State, Nigeria. It lies between latitudes 9° 35'N and 10° 30'E of the equator and longitudes 9° 35'0"N and 12° 0"E of the Greenwich Meridian. The Northern part of the State has six (Yorro, Zing, Jalingo, Karimlamido, Ardo-kola, and Lau) Local Government Areas. It has an estimated land area of 14,749 km² with a population of 790,083 people (National Population Commission, NPC, 2006). The NPC had projected an annual growth rate of 3.5% which brought the population figure to 818,739

people as of 2017. The area is characterized by high and lowlands. It is bounded to the North by Adamawa state, to the east and west by Central Taraba State, and to the west by Gombe and Bauchi States. The area has a tropical climate with marked dry and rainy seasons. The temperature varies from 16⁰C during the early harmattan period (early December) to about 35⁰C at the peak of the hot dry period in March and April. Rainfall ranges from 215 mm to 1000 mm per annum (Taraba State Diary, Rainfall Data, 2004).

The fertile soil and good climate allowed for the growth of staples such as maize, sorghum, rice, millet, cassava, g/nut, cowpea, and Bambara nuts. The vegetation of the area also provides good pasture for the rearing of animals. The indigenous groups found in the area include Jukun-kona, Mumuye, Yandan, Jenjo, Wurkum, Hausa, and Fulani. Majority of the people are farmers. The target

population for this study comprises all farmers in Northern Taraba State.

Sampling Procedure and Sample Size

Multistage sampling procedures were used to select respondents for this study. In the first stage three (3) local government areas were purposively selected from Northern Taraba State Nigeria based on the prevalence of Agricultural productivity in these areas. In the second stage, (3) villages were selected purposively. “In the third stage, simple random sampling was used in the selection of sample size of 120 farmers, using Snowball technique

Method of Data Collection

Data were collected using structured questionnaires, administered to the farmers in the study areas with the help of trained enumerators.

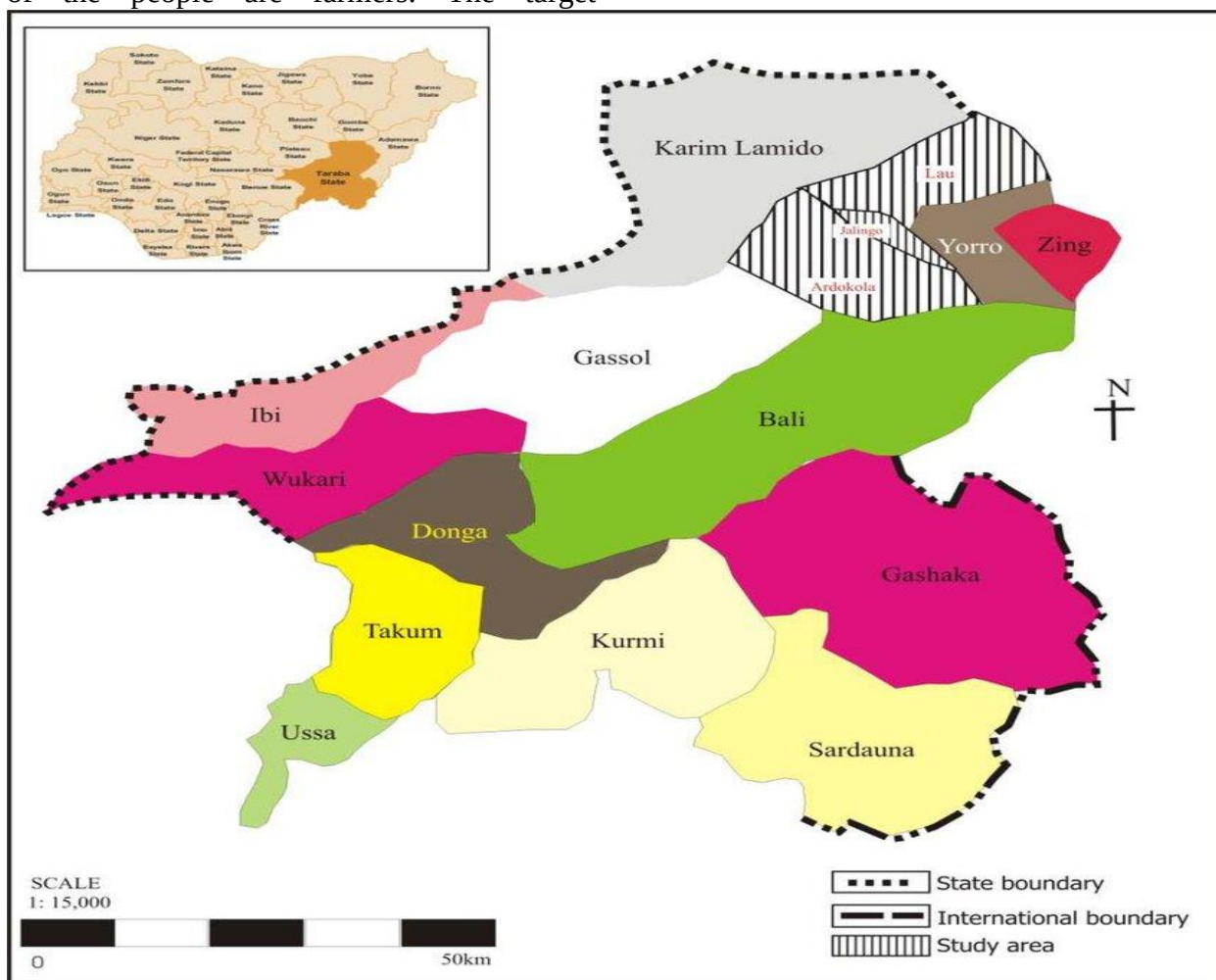


Figure 1: Map of Taraba State showing the Study Area

Source: Department of Geography, Taraba State University (2021)

Method of Data Analysis

Descriptive statistic such as frequency count, percentage, mean, standard deviation, and logistic regression were used to achieve objective (i), (iii), and (iv).

The logistic regression model is specified below,

$$Y = \frac{\exp(B_0 + B_1 X_1)}{1 + \exp(B_0 + B_1 X_1)} \quad 1$$

Where Y is Agricultural Productivities, β_0 is intercept, $\beta_1, \beta_2, \text{ to } \beta_n$ are coefficient of independent variable $X_1, X_2 \text{ to } X_n$.

X_1 = Road

X_2 = Health facilities

X_3 = Schools

X_4 = Portable water

X_5 = Financial institution

X_6 = Market

RESULTS AND DISCUSSION

Available Rural Infrastructures for Agricultural Production in Northern Taraba State

The results of the availability of basic rural infrastructure necessary for agricultural production is shown in Table 1. The result indicate that the available road network in the northern part of Taraba State is tarred road (52.5%), followed by un-tarred road (40.8%). This may be so because most of the areas under study have a federal roads passing through it. Good transport facilities not only enhance the process of economic growth in the rural areas by making products and markets function more effectively, but they also increase the social wellbeing of the rural population by facilitating movement to places where other essential social services, such as healthcare facilities and education facilities are available. This study is in defiance of the study of Olorunfem (2020) on rural road infrastructural challenges: An impediment to agricultural development in Idanre Local Government Area of Ondo State, Nigeria, that the available road network and drainage system in Nigeria are poor. Also, the main transport facilities

present are motorable road (67.5%), Motor Park (20.8%), and Boat/ferry system (10.0%). This implies that the road network is the main transport facility in the area. The main means of transport is self-owned means, and the average distance to any motorable road is 3.6km. This is an indication that road transport is the most predominant mode of transportation all over the world, and this is a confirmation of the crucial role that transport plays in the socioeconomic development of a nation (Taghvaei et al., 2020).

Also, Table 1 shows that there is a health facilities (90.8%) present in the area, and the types of health facilities available are general hospital (46.7%), primary health care (36.7%), and Private Hospital (10.0%). This implies that most of northern Taraba State have health facilities. the presence of a health center was obvious since the study area was in a rural setting close to the urban area. The average distances to the nearest health facility is 11.4km/hr. This study agrees with the finding of Daud et al. (2018) that farmers in Oyo State have access to functioning healthcare services in the area.

Furthermore, the result in Table 1 shows that the majority 75.0% of the respondents indicated that there is no source of portable water in the study area. Also, the most of the respondents used River/Stream (35.0%), Borehole (25.0%), and Open Well (18.3%). The average distance to a source of water is 1.6km/hr. This is an indication that the majority of farmers have no access to portable water and depend on natural sources of water for their farm and domestic activities. Also, the available sources of water are located a little far away from the farmer's house, which they must trek for few minutes before getting water. The result is in tandem with Ogunniyi et al. (2021), who observed that rural communities are seriously marginalized in terms of essential elements of development such as portable

water, health care, education, and recreational facilities.

Similarly, the major types of Educational Facilities Available are primary school (47.5%), adult education (20.8%), and Secondary School (10.0%). The majority (90.8%) of the respondents agreed that they have used one of these facilities for their education, as shown in Table 1. This implies that the study areas have one form of education or the other. Education is an important factor in the improvement of farmers' technological know-how. It, in turn, boosts production across individual farms and the community. This study is similar to the study of Alao (2021) on the effect of access to infrastructure on productivity and empowerment of rural women farmers in Southwestern Nigeria, where primary and secondary schools' facilities are available in the study area.

The results on the types of market show that the Periodic Market (70.8%) is the main type of market in the study area. The average distance to the market from farmer's house is 8.7km/h. This implies that most farmers have access to periodic markets, which are mostly open markets. Market Facilities are central to agricultural activities. In the absence of access to market facilities, it will be difficult for farmers to sell their produce profitably (Alao, 2021).

Table 1 shows that the majority (54.2%) of the respondents indicated that financial institutions are available in the study area. Also, the major types of financial institutions present are Micro-Finance Banks (32.5%), Commercial Banks (31.7%) and Non-Interest Banks (15.8%). Most of the respondents source their credit from

micro-finance bank and non-interest banks (27.5%), commercial bank (26.7%), and Agricultural Bank (12.5%). This study is similar to Orji *et al.* (2020).

Effects of Rural Infrastructure on the Production Activities of the Farmers

The result of the effect of rural infrastructure on production activities of farmers is presented in Table 2. The adjusted R^2 is 0.8101. This indicates that 81 percent of the variations in the productivity of the farmers in the study area could be explained by the considered explanatory variables (rural Infrastructure). The result shows that road, school, and portable water are significant at 10% and 5% levels of significant. This implies that good quality rural access roads have a strong positive correlation with higher agricultural productivity. This study agrees with the study of Udeuhele and Eze (2022), who reported a significant and positive correlation between the category of road access and economic productivity of farmers' output. Also, schools play a very important role in the education of farmers and the positive relationship indicates that the higher the level of education of the farmers, the higher their output in agricultural production.

Portable water has a significant effect on agricultural production. This means that the availability of portable water influences people to engage more in agriculture. This result conformed with Wang *et al.* (2023), which explained that the spread of needed infrastructure and introduction of appropriate technology in rural areas would markedly improve rural economy and their output.

Table 1 Available Rural Infrastructures for Agricultural Production in the Study Area

Variable	Frequency	Percentages	Mean	Standard Deviation
Availability of Road				
Tarred Road	63	52.5		
Un-tarred road	49	40.8		
No road Network	8	6.7		
Transport Facilities				
Motor able road	81	67.5		
Motor part	25	20.8		
Boat/ferry system	12	10.0		
Railway system	1	.8		
Others	1	.8		
Main Means of Transport				
Self-Owned Means	34	28.3		
Public Transport	86	71.7		
Distance to any Motor able Road			3.5833	5.11643
Availability of Health Facility				
No	11	9.2		
Yes	109	90.8		
Types of Health Facilities Available				
General Hospital	56	46.7		
Private Hospital	12	10.0		
Primary Healthcare	44	36.7		
Pharmacy	7	5.8		
Patent Medicine Store	1	.8		
Distance to the Nearest Health Facility			11.3583	24.41132
Availability of Water Source				
No	90	75.0		
Yes	30	25.0		
Source of Water in the Community				
River/Stream	42	35.0		
Open Well	22	18.3		
Closed Well	21	17.5		
Borehole	30	25.0		
Tape Water	5	4.2		
Distance to Water Sources			1.5542	1.17272
Available Educational Facilities				
None	17	14.2		
Primary School	57	47.5		
Secondary School	12	10.0		
Tertiary	8	6.7		
Adult Education	25	20.8		
Others	1	.8		
Used any of these facility				
No	11	9.2		
Yes	109	90.8		
Types of Market				
Daily Market	33	27.5		
Periodic Market	85	70.8		
None	2	1.7		
Distance to Nearest Market			8.7	19.367
Availability of Financial Institution				
No	55	45.8		
Yes	65	54.2		
Types of Financial Institution				
Commercial Bank	38	31.7		
Micro-Finance Bank	39	32.5		
Agricultural Bank	17	14.2		
Non-Interest Bank	19	15.8		
Any Others	7	5.8		
Sources of Credit for Agricultural Production				
Commercial Bank	32	26.7		
Micro-Finance Bank	33	27.5		
Agricultural Bank	15	12.5		
Non-Interest Bank	33	27.5		
Any Others	7	5.8		

Source: Field Survey (2024)

Table 2: Effects of Rural Infrastructure on the Production Activities of the Farmers

Variable	Coefficient	Std. Error	z-Statistic	Prob.
Constant	2.4808	1.1387	-2.1787	0.0294
Road	0.0360	0.0198	1.8201	0.0688*
Health	0.1255	0.0872	-1.4393	0.1501
Schools	0.38114	0.2303	1.6560	0.0977*
portable water	0.3983	0.1833	2.1722	0.0298**
Financial Institution	0.1851	0.2137	0.8660	0.3865
Market	0.1481	0.4356	-0.3399	0.7339
R-squared	0.8101			
Prob (LR statistic)	0.0464			

Source: Field Survey (2024)**Constraints to Adequate Rural Infrastructural Facilities**

The result of the constraints to adequate rural infrastructure is presented in Table 3. The result shows that corruption on the part of government personnel ($\bar{x}$ =3.0), political instability ($\bar{x}$ =2.9), and high cost of infrastructural materials and equipment ($\bar{x}$ =2.6) are the major factors hindering

adequate rural infrastructure in rural areas. This implies that corruption on the part of the government is a major factor hindering rural infrastructure. For rural infrastructure to be available, corruption must be reduced to the minimum level. This study agrees with the study of Daud *et al.* (2018) on rural infrastructure and profitability of food crop production in Oyo State, Nigeria.

Table 3: Constraints Hindering Adequate Rural Infrastructural Facilities

Constraint	Mean	Std. Deviation
Corruption on the part of government personnel	3.0	1.04988
Political instability	2.9	.90280
High cost of infrastructural materials and equipment	2.6	.89627
Involvement of unqualified man power during the construction process	2.3	.59119
Physical environmental issues e. g. Topography	2.2	.50203
Lack of fund	2.1	.50098
Low internally generated revenue	2.1	.564099
Economics problems e. g. inflation, current exchange rate	2.1	.56410
Misplacement of priority on the side of leaders and government	2.0	.69492
High maintenance cost of infrastructural facilities	1.8	.70487

Source: Field Survey (2024)**CONCLUSION**

This study concludes that the available rural infrastructures in northern Taraba State, which include health facilities, portable water, schools, and Road network have significant impact on agricultural production. The major constraints hindering adequate rural infrastructure by the farmers are corruption on the part of government personnel, political instability, and high cost of infrastructural materials and equipment.

RECOMMENDATIONS

Based on the findings of the study, farmers are recommended to team up to engage in community self-help programs/projects by contributing funds to provide non-existent infrastructure, or by seeking the help of the government to support their efforts. Concerted efforts should be made by rural development stakeholders (government, NGOs, and the private sector) to improve

the provision, maintenance, and sustenance of the infrastructure for a sustainable rural livelihood. Also, a bottom-up approach to development and the restructuring of the third tier of governance, the Local Government system, will provide a plausible vent for a quick and even development of rural areas in Nigeria.

The study recommends that to improve agricultural production in the area, social services such as a hospital, a good road network, school, electricity and water among others, should be provided by the government in conjunction with a private organisation to better the life of dwellers in the rural areas. In general, this will motivate farmers most especially the young ones to stay in the rural areas and engage in farming activities to enhance food security and reduce rural-urban migration.

REFERENCES

- Alao, T. K. (2021). Effect of access to infrastructure on productivity and empowerment of rural women farmers in Southwestern Nigeria (Doctoral dissertation). Pp. 45.
- Daud, S. A., Omotayo, A. O., Aremu, A. O., & Omotoso, A. B. (2018). Rural infrastructure and profitability of food crop production in Oyo State, Nigeria. *Applied Ecology & Environmental Research*, 16(4).
- Department of Geography, Taraba State University. (2021). *Agricultural development programme report*. Taraba State University. Pp. 45
- Kaiser, N., & Barstow, C. K. (2022). Rural transportation infrastructure in low- and middle-income countries: a review of impacts, implications, and interventions. *Sustainability*, 14(4), 2149.
- Maja, M. M., & Ayano, S. F. (2021). The impact of population growth on natural resources and farmers' capacity to adapt to climate change in low-income countries. *Earth Systems and Environment*, 5(2), 271-283.
- Ogunniyi, A. I., Omotoso, S. O., Salman, K. K., Omotayo, A. O., Olagunju, K. O., & Aremu, A. O. (2021). Socio-economic drivers of food security among rural households in Nigeria: Evidence from smallholder maize farmers. *Social Indicators Research*, 155, 583-599.
- Olorunfemi, S. O. (2020). Rural road infrastructural challenges: An impediment to agricultural development in Idanre Local Government Area of Ondo State, Nigeria. *Ghana Journal of Geography*, 12(2), 108-124.
- Omotoso, A. B., Daud, S. A., Okojie, L., & Omotayo, A. O. (2022). Rural infrastructure and production efficiency of food crop farmers: Implication for rural development in Nigeria. *African journal of science, technology, innovation and development*, 14(1), 197-203.
- Orji, A., Ogbuabor, J. E., Anthony-Orji, O. I., & Alisigwe, J. N. (2020). Agricultural financing and agricultural output growth in developing economies: Any causal linkage in Nigeria? *Journal of Development Studies*, 36(4), 123-145.
- Otieno, M. O. (2020). Factors affecting performance and functionality of rural market center in Central Alego Ward, Siaya County-Kenya a study of Boro, Ndere, and Ratuoro markets

- (Doctoral dissertation, University of Nairobi). Pp 45.
- Owigho, O., Eromedoghene, E. O., Akeni, T. E., Ebewore, S., & Ofuoku, A. (2023). Farmers' Perception of Effectiveness of Rural Infrastructure on their Livelihood in Delta State, Nigeria. *International Journal of Research and Innovation in Social Science*, 1(2), 41-57.
- Taghvaaee, V. M., Nodehi, M., Saber, R. M., & Mohebi, M. (2022). Sustainable development goals and transportation modes: Analyzing sustainability pillars of environment, health, and economy. *World Development Sustainability*, 1, 100018.
- Udeuhele, G. I., & Eze, A. V. (2022). Rural access roads and the quest for agricultural development: An appraisal of the conditions in South-East In Nigeria. *Global Journal of Social Sciences*, 21(1), 21-34.
- Wang, G., Wang, D., & Zhang, L. (2023). Assessing the Impact of Government Behavior on Regional High-Quality Development: A Case of Fiscal Expenditures on People's Livelihoods in China. *Land*, 12(10), 1924.
- Woodhill, J., Kishore, A., Njuki, J., Jones, K., & Hasnain, S. (2022). Food systems and rural wellbeing: challenges and opportunities. *Food Security*, 14(5), 1099-1121.
- Ye, F., Qin, S., Nisar, N., Zhang, Q., Tong, T., & Wang, L. (2023). Does rural industrial integration improve agricultural productivity? Implications for sustainable food production. *Frontiers in Sustainable Food Systems*, 7, 1191024.
- Zubair, A. D. (2022). Participation of Rural Dwellers in Community Self-Help Activities in Kwara State, Nigeria (Master's thesis, Kwara State University, Nigeria). Pp 10.