The Study of Rural Infrastructural Facilities in Kajuru Area, Kaduna State of Nigeria: A Spatial Analysis for Planning

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Abstract

The importance of rural infrastructure has long been recognized as crucial to promoting economic growth and development. This is obvious considering its wide range of influence on increased productivity, generation of income and improved quality of life. However, this role depends largely on the extent to which the infrastructures are adequately provided, distributed over space and maintained particularly in the rural communities. The objective of the study is to examine the spatial distribution, the condition and maintenance of the rural infrastructural facilities in Kajuru area, Kaduna State of Nigeria. Primary data was collected from field observation, inventory of the infrastructure and administration of questionnaire. Some one hundred and sixty five samples were collected through a purposive sampling technique. Descriptive statistics such as mean, averages and percentages was adopted to summarize the data into tabular forms. Also, standardized (Z-score) analytical technique was employed to depict spatial variation in the rural infrastructural facilities. The study showed that five districts were privileged and some eleven districts wre under-privileged. K/maga has more than average share of (16.18), followed by Kufana (13.71), Idon (5.44), Kalla (3.68) and Iri (0.83) in that order of performance. Kyamar (-10.8) seemed to be the most disadvantaged among the districts, followed by U/Aku (-7.81), Kajuru (-6.52), Sunka (-5.51), D/Gaiya (-3.97), Rimau (-3.69), Dawaki (-2.28) and the least under-privileged was Iburu district with a score of (-0.6). On the basis of the findings, one recommends among other things that community development strategy should be strengthened such that community embarking upon infrastructural projects such as road construction, building of schools, health centres and water supply should be given financial and technical assistance by the government and by so doing, communities shall become partners in progress with government in economic growth and development of rural areas.

Key Words: Infrastructure Rural Facilities Analysis Spatial Planning

1. Introduction

In spite of the growing importance attached to rural infrastructure, the rural areas have long been deprived and neglected even though they constituted the majority of the Nigeria's population. It is obvious that rural population has limited access to modern farming inputs, productive resources, and basic infrastructures such as schools, health centres, potable water, good feeder roads, culverts, storage and irrigation facilities (Fakayode *et al,* 2008). In addition, inadequate and low qualities of infrastructures could have serious implication for welfare and persistence of poverty. It is a consensus among scholars (Ndulu, 2006; Calderon and Serve, 2008; Egbetokun, 2009) that rural infrastructures are the criteria for the success of public and private efforts aimed at accelerating agricultural and rural development. It is obvious that one cannot expect rapid socio-economic development in the rural areas without adequate provision for infrastructural facilities. Omofonmwan, (2004) had remarked that one of the critical factors that contributed to the high level of rural poverty is the inadequate infrastructural facilities.

The role of infrastructural facilities in the grassroot development cannot be overemphasized. UN (2011) had remarked that rural infrastructure plays a critical role in poverty reduction, economic growth and employment for the rural poor.

Moreover, Ale *et al* (2011) shared similar opinion that provision of basic rural infrastructures is a prerequisite for for developing economies to stimulate economic growth and reach the state of economic recovery and poverty alleviation through increasing and diversifying agricultural outputs. Also, (Calderon, 2009; Egbetokun, 2009) observed that the provision of infrastructures are part of integrated rural development strategy which combine the development of various areas of the rural society including agricultural, educational, health, nutrition, electrification, water supply and cooperatives simultaneously. This serves as a holistic approach towards solving the rural problem to a large extent. Bamboye (2007) pointed out that rural individual are poor because they do not have access to infrastructural services for improving quality of life. In the same vein, (Oyewole and Oloko, 2006) had remarked that adequate infrastructures can reduce the cost of production, which affects productivity, level of outputs, and employment. had remarked that where infrastructures are put in place, level of agricultural productivity will be increased and if otherwise, citizens will suffer particularly the rural poor, thus economic renewal and societal welfare become worse and halted (Perkins and Luiz, 2005; Akinola, 2007). Therefore, a strategy to reduce rural poverty needs to incorporate policies to develop both production and welfare oriented infrastructures in order to improve poor people's productive capacity and quality of life.

Recognizing infrastructural development as a critical factor in rural development, a number of government programmes were initiated in the past, specifically aimed at improving basic services and infrastructural development for the rural poor. In history, the federal government of Nigeria has mounted progrmmes such as Agricultural Development Projects (ADP's), Directorate of Food, Roads, and Rural Infrastructures (DFRRI), River Basin Development Authority (RBDA) and of recent the National Fadama Development Project (NFDP). Oisasoje (2012) noted that rural infrastructure, if adequately provided and maintained can enhance the quality of rural life. However, rural people have benefited very little from most of these programmes (Olayiwola and Adeleye, 2005). It is against this background that we embarked upon the study of rural infrastructures in Kajuru local government area, Kaduna State

2. Studies in Rural Infrastructure: An Overview

One of the critical problems facing developing countries is the inadequate provision and maintenance of rural of infrastructure. The poor state of infrastructure in rural areas poses a great challenge to rural economic development efforts as it affects the level of productivity and inhibits full realization of potentials of farm households thereby leading to low agricultural productivity, low level of income, a fall in standard of living and a high rate of poverty among the rural dwellers. The infrastructural facilities that should be a catalyst of encouragement for the agricultural production are simply not available. Moreover, the inadequacy of these infrastructures that can improve the quality of life of the people is one major factor that impedes rural socio-economic transformation (Abumere, 2002; Adeoye, *et al*, 2011). The development of rural infrastructure must be seen as an integral part of the entire economic growth and development.

In Nigeria, a major problem is the pattern of distribution of these basic infrastructures which exhibits urban bias; hence poverty is at a higher level in the rural areas than urban areas. A considerable emphasis is placed on the development of urban infrastructure either directly or indirectly to the almost neglect of the rural areas (Oguzor, 2011). Apart from poverty problem, the prime factor for rural-urban exodus is the attraction of the infrastructural facilities placed in the few urban cities and this trend will continue unabated until such facilities are equitably provided and sustained in the rural communities. Aderamo and Magaji, (2010) remarked that the sustainability of the provision, operation and maintenance of appropriate rural infrastructures has eluded the hopes and aspirations created in the minds of rural folks. Umoren *et al* (2009) observed that rural infrastructural development has not been taken seriously in Nigeria and it is often difficult to quantify its direct influence on the quality of life in rural areas.

Akinola (2007) studied coping strategies with infrastructural deprivation through collective action among rural people in Nigeria and discovered that the failure of the government to properly address the problem of rural infrastructure led to the adoption of self-governing techniques by the people through collective action. The result further explained that the rural people organized themselves into appropriate institutional arrangements, mutual agreements and shared understanding, planned and execute public goods and services that directly touched the lives of the people. Fakayode *et al* (2008) examined the place of infrastructures in the agricultural productivity of farm households, using farm level data from Ekiti State, Nigeria.

In study, eight infrastructures were surveyed namely road, health centres, market centres, water supply, electricity, banks, communication gadgets and education, and their influence on the agricultural productivity. The data obtained were analyzed using the total factor productivity (TFP) and the ordinary least square (OLS) regression analyses. The study revealed that besides road infrastructures which were found to be in bad state, all other infrastructures were found to be much available and the computed infrastructural index of 032 was found to low for the area.

Similarly, Ale *et al* (2011) examined the importance of rural infrastructural development in solving the problems of food security and city congestion, pointing out that many rural farm families move to the cities where infrastructures are adequately provided at the expense of food production for the large populace all in search for good living. The outcome of the study made it obvious that the level of infrastructural development in rural Nigeria is nothing but poor. It further stated that if the country will continue at this level of lip service in the provision of infrastructural facilities, she will not be able to meet the vision 2020 target of providing enough food and reducing city congestion as contained in the millennium development goals (MDGs).

Adeoye *et al* (2011) examined rural infrastructure and profitability of farmers under Fadama-II project in Oyo State. The study made use of primary data collected from two hundred and sixty four (264) farmers through a multi-stage sampling technique. It compared the infrastructural development between Fadama II in the local government areas and non- Fadama II areas using infrastructural index and gross margin. The result showed that more than halve (59.1%) of the villages in Fadama-II local government areas have more infrastructures than non-Fadama II villages. Moreover, they were found to be significantly better-off in a number of areas including agricultural production, and household income. This implies that Fadama-II project has contributed significantly to the development of infrastructures in Oyo state.

By and large, the focus of the present study therefore is to assess the rural infrastructural facilities in the districts of Kajuru local government area, Kaduna State.

Aim and Objectives

The aim of this research is to study the rural infrastructural facilities in Kajuru local government area, Kaduna State. However, the specific objectives of the study are to:- (i) examine the socio-economic characteristics of the respondents in the study area (ii) examine the spatial distribution of the infrastructural facilities among communities in the study area (iii) examine the condition of the rural infrastructures (iii) assess the management/maintenance of the infrastructural facilities in the study area.

3. Methodology

3.1 Data Selection

The following rural infrastructural facilities are carefully selected for the study. They are:-
I = rural roads (Km); II = culverts; III = boreholes; IV = schools; V = health centres; VI = cooperatives; VII = barns/stores; VIII = extension services; IX = rural energy; X = wells

3.2 Sources of Data.

The main sources of data upon which the empirical analysis was based include: - Primary and Secondary sources of data. Primary data was collected from the inventory of infrastructural facilities noting the types of the infrastructures, location, providers, and quantity provided, the condition, management responsibility, and accessibility of these infrastructures by the people. In addition, questionnaire was designed and administered among the respondents in the study area. It is a major research instrument for the study. The secondary data was collected from the libraries, text books, national bureau of statistics (NBS), journals, magazines, bulletins and documented materials.

3.3 Sample Size and Sampling Techniques

The study area is sub-divided into 16 districts to reflect the political divisions namely:- K/Magani, Rimau, Kalla, D/Gaiya, Dawaki, Sunka, Kajuru, Buda, Kyamara, Kufana, Afogo, Idon, Iri, Kutura, Maro and Kajuru. To determine the sample size required for this research, Krejcie and Morgan's (1970) sampling table was adopted where population size ranges from 50,000-74,999 is represented by 381 sample size. It assumed 95% confidence level, and 5% margin of error. Therefore, with a population of 52,342 (NPC, 2006) of the sampled communities, a total of 381 respondents were purposively selected for the study.

3.4 Methods of Data Analysis

A combination of descriptive and inferential statistical techniques was employed in the analysis of the data. Descriptive statistics was used to summarize the data using frequency distribution, percentages and mean into tabular form. The standardized scores (Z-score) analytical technique was adopted to depict spatial variation in the distribution of the rural infrastructural facilities among the districts in the study area. The Z-score model for analyzing inequalities has been used by (Ifabiyi, 2011; Aderamo and Aina, 2011. It is simple, elegant, and it possessed the opportunity to rank the unit areas in accordance with their performance in infrastructural development.

Z-score formula:-

$$Z_i = \frac{X - \bar{X}}{SD}$$

Where Z_i = Z-score for observation i

X = the original value in the cell,

$\bar{X}$ = the mean for the variable, and

SD = the standard deviation of the X values and

$$SD = \sqrt{\frac{\sum(X - \bar{X})^2}{N}}$$

Where N = Total number of observation.

4. Data Analysis and Discussion

4.1 Socio-Economic Characteristics of the Respondents.

The study examined socio-economic characteristics of the respondents and the result are presented in Table 1. It revealed that about (86.6%) of the respondents were males and the remaining 13.4% were females. This wide margin is an indication that household heads that are mostly males are more concerned about rural infrastructures than their female counterparts. Table 4.1 shows that (76.7%) of the respondents were of ages between 26 and 45 years and the modal age group (45.2%) of the sampled respondents is between 31-40 years of age. About (21.9%) represent 26- 30 years of age, and (21.4%) fell within 36-40 age group. Moreover, (8.8%) and (4.4%) represented 41-45 and over 46 years respectively with a mean age of 33.5 years. It can be said that most of the respondents at this stage fall within the active working class indicating the active labour force when they can carry out meaningful economic ventures (Egbetokun, 2009). As regards marital status, (92.8%) were married with just about 3.3% widowed/widower, while only (2.5%) were single and (1.4%) divorced. The result is not unrelated with the culture, religion and norms of the people. It indicates the importance attached to marriage institution in the study area. Ekong (2003) remarked that people marry at an early age for the benefit of having children to help them on farming activities. The result also implies that since there were many married middle age and few unmarried, infrastructures such as the maternity centres and educational facilities should be provided and be made available in order to cater for the expected increasing number of children (Ipingbeni, 2008).

In rural environment where agriculture is the main economic activity, the size of the household plays a very important role since it influences the supply of labour for immediate family employment. Adeoye *et al*, (2011) had remarked that the household size is an important variable especially in situation where human energy is a major source of power for carrying out farming activities. It is also seen as index of prosperity (Uboh et al, 2009) as it is sometimes considered in determining a wealthy farmer. The family size of the respondents showed that more than halve (54.2%) of the respondents belong to the class range of between 6-10 members. About (2.2%) of the respondents were found within the upper class range of 16-20 members, (33.7%) were in the lower range class of 0-5 members. Only 9.9% have between 11-15 family members. The average household size in the study area was found to be 8 members which is higher than 5, the national average household size (NBS, 2007). The implication of having a relatively larger family size depicts the necessity to make rural life better through adequate provision of infrastructures such as schools and other forms of social infrastructures which are capable of transforming lives. This will also help to reduce rural-urban drift.

On educational attainment, (10.7%) of the respondents have no formal education, primary school education accounted for (60.5%), secondary school accounted for (19.5%) and only (9.3%) of the respondents have tertiary education. It can be inferred that literacy level is relatively high compare to other rural areas. Considering occupation, majority of the respondents engaged in agriculture.

About (81.6%) of the respondents are farmers, (9.6%) engaged in trading activity and about (8.8%) of the respondents were civil servants. On the duration of residence, more than half (57.3%) of the respondents have stayed in the study area for 31 years and above, followed by (19.7%) who had lived for between 26-30years. Also, some (8.2 %) lived for between 21-25 years and another (5.8%) lived for between 16 – 20 years. While (3.0%) lived for 11-15 years, (5.2%) lived for 6 -10 years. Only (0.8%) of the sampled respondents lived for 0-5 years. It can be deduced here that 91% of the respondents lived for more than 15 years in the study area.

4.2 Spatial Variations in Rural Infrastructural Facilities

A close examination of Table 2 reveals that in terms accessibility by roads, only 4 districts were advantaged with Maro having the highest score value of (3.11). The other advantaged districts include Kufana, Idon and Kutura with score values of (1.5), (0.53) and (0.05) respectively. Dawaki with a score value of (-1.08) appears to be the most under-privileged. As regards culverts, 7 districts were found advantaged and K/Magani ranked first with a score value of (2.41), while Rimau, D/Gaiya, U/Aku and Kyamara with a corresponding score value of (-1.3) were discovered the most deficient of the 9 disadvantaged districts. It is pertinent to note that the distribution of boreholes, Kufana district with a score value of (2.52) had lion share above 5 advantaged districts, followed by Kalla (2.12), Dawaki (0.26), and K/Magani (0.12) in that descending order of performance. Kyamara with a score value of (-1.48) was most disadvantaged out of the remaining under-privileged districts. Regarding schools and health centres, there are 5 advantaged and 11 disadvantaged, and 3 advantaged and 13 disadvantaged. K/Magani was found more advantaged in the two categories with score values of (2.12) and (2.76) correspondingly, whereas Buda, Sunka, Kajuru, U/Aku and Kyamara having the same score value of (-1.08), similarly Iri and U/Aku districts with same score value of (-1.81) and considered under-privileged. Considering the distribution of cooperative societies, 7 districts were found advantaged among them is Iri district leading with a score value of (2.74). On the other hand, 13 districts were considered under-privileged with Sunka, Kajuru and Kyamara having least uniform value of (-1.43).

One unique feature from the result of warehouse distribution is 50:50 ratio shared between advantaged and the disadvantaged districts. Idon has the lion share with score values of (1.94) and Dawaki (-1.32) appeared to be most deprived. Both K/Magani and Kufana had a uniform score value of (2.73) are considered the only 2 advantaged districts as far as the distribution of agricultural extension service is concerned. The remaining 14 districts are said to be disadvantage with score values of (-0.3). Moreover, with a uniform score value of (0.45), fairness was found existing as regards to the distribution of energy among the 12 advantaged districts. While the remaining 4 districts also with a uniform score value of (-1.82) are considered disadvantaged. Again, among the only 2 districts considered advantaged in terms of spatial distribution of wells, K/Magani with a score of (3.45) emerged the most advantaged while Dawaki with a score value of (-0.62) was most under-privileged.
The results show that inequalities exist in varying degrees with the distribution of infrastructural facilities in the study area. This result corroborated with Adefila (2008) where he found a marked spatial variations in infrastructural development in Plateau State of Nigeria. The implication here is that there will be disparity in the living standard and this is not a surprise because spatial inequality in infrastructure among regions has existed since the dawn of civilization (Aderamo and Aina, 2011; Madu, 2012).

4.3 Conditions of the Rural Infrastructures

The examined the conditions of the rural infrastructural facilities in the study area and the results are presented in Table 4. It revealed that the conditions of majority (70%) of the roads available in the study area are assessed to be poor. The access roads to farms in the districts are lacking and in few communities where they are provided, the roads are seasonal. The seasonality nature of the roads was noticed to be either as a result of poor construction or inadequate road facilities such as culverts, bridges and channels. Some (6.3%) and (23.3%) of the respondents expressed better and good respectively, and this is attributed to the fact that most of these respondents are residing in communities along the major roads that cut across the study area.

Also, some (43%) of the respondents considered the condition of the culverts to be good, and (20.6%) said the conditions are better. Some (14.8%) rated the culverts to be best while (21.6%) assessed the condition to be poor. Obviously, some of the culverts were in a deplorable condition arising from total neglect and poor maintenance culture of the people. Some 75 boreholes were available in the study area but only 50 were found to be functioning representing some (66.6%). The respondents' assessment of the bore-holes reveals some (66.0%) to be good, (21.4%) said it is better, (3.6%) for best, and (9.0%) rated them as poor.

Regarding facilities in schools, some (22.5%) of the respondents rated them best, (20.8%) as better, (37.8%) as good and (18.9%) rated them as poor. Also, the health facilities are rated. Some (10.7%) said it is best, (21.6%) as better, (59.5%) said they are good and (8.2%) of the respondents rated the health facilities as poor. Concerning the operation of cooperatives, some (20.0%) rated them best, (24.9%) as better, (40.6%) as good and only (14.5%) said they are poor. The respondents assessed the condition of the bans and silos as best (3.6%), (53.9%) as better, (5.8%) as good and some (3.6%) rated them as poor. With agricultural extension serves, some (6.6%) of the respondents indicated best performance, (18.4%) as better, (41.6%) as good, some (33.4%) rated them as poor in that order. Electricity supply was generally rated poor (98.9%) by the respondents. Some minority (1.1%) rated it good. Considering the condition of the well (26.6%) rated it best, (24.6%) assessed it to be better and (32.1%) rated it good.

4.4 Maintenance of Rural Infrastructure

The study examined the responsibilities of the State, local governments; community as well as individual in the process of maintenance of the rural infrastructural facilities and the results are presented in Table 4. Some (26.0%) of the respondents indicated state government participation in roads maintenance and community participation (52.3%). This is done through communal labour on weekly basis. Some (21.4%) stated the involvement of local government in road maintenance.

Culverts are maintained in similar process with the road. Some (81.4%) were performed by the community, (15.6%) by the local government and some (3.0%) by individuals. Also, the maintenance of the boreholes is largely handled the communities (50.7%), state government (26.5%) and some (23.8%) for individuals in the various communities. The maintenance and repairs of school facilities are done largely by the communities (54.2%), some (15.6%) by the state and (28.8%) by the local government participation and (1.4%) for individuals in the community

With regards to health care facilities, some (87.4%) are maintained by the local government whereas some (7.9%) are performed by the State government and some (1.4%) are performed by individuals in the community. The maintenance of cooperatives is shouldered by the executives of each cooperative (69.3%), the State government through designated Ministry of Commerce and Industry (20.0%) and some (10.7%) were performed by the local governments. The result clearly shows that warehouses and wells being privately owned infrastructures are completely managed by individual households. While the management agricultural extension services (AES) in the study area is evident to be the sole responsibility of the local government (80.6%), State government constitutes (17.5%) and only (1.9%) performed by the community. The management of electricity is the responsibility of the State (43.3%) and local government (33.4%) as well as the beneficiary communities (32.3%).

5. Policy Implication of the Study

Since rural road is found to have significant effect on the distribution of other facilities be it physical or social facilities, government at all levels should team up to improve the quality of road network not only in the study area but also in rural communities at large with a bid to ensure accessibility and equitable distribution of rural infrastructural facilities. This will help to reduce the level of poverty in the long run.

Furthermore, considering the positive effects of rural infrastructure on the lives of the people, and to avoid rural-urban drift, there is the need for the provision of more infrastructures and their maintenance. Governments at all levels should partner with other private organizations to undertake the provision and maintenance of the rural infrastructural facilities in order to meet the needs and aspirations of the rural people. The appropriate rural development strategy should be in form of infrastructural development projects.

Governments should focus much attention on community-driven development projects when formulating socio-economic development plans. Projects that are conceived, planned and implemented by the communities themselves will be better sustained and maintained. Indeed, participatory approach to the location of these infrastructures in the rural communities of developing nations should also be adopted.

The community development strategy should be given serious attention as entrenched in the second national development plan. The policy document recognized the role that community can play in the development of the rural areas. It realized that government could not provide all the needed infrastructural facilities and look up to tapping the creative potentials and resources embedded in rural communities.

Communities that embark upon projects such as road construction, building of schools, colleges, health centres and market infrastructures should be given capital and technical assistance by the government and by so doing, the communities will be seen as partners in progress and this could go a long way to reduce community over-dependence on government. It would also encourage a balance development.

6. Concluding Remarks

Realizing that provision of rural infrastructures is basic to rural economic development, this study has endeavoured to bring into focus the condition, maintenance and variation in rural infrastructural facilities in Kajuru local government area of Kaduna State. The facilities are not in good condition and this is attributed to poor maintenance culture from the governments, communities and individuals. All hands must be on deck towards ensuring adequate provision and proper maintenance of the rural infrastructural facilities.

It is evident that physical, social and institutional infrastructures are unevenly distributed over space. While some localities are having more than their average share of the facilities over and above other areas, there exist many areas that are lagging behind. The infrastructures are found to be localized in some areas at the expense of other rural communities.

This lopsidedness pattern of infrastructural development should be given more attention by adopting a discriminate investment in infrastructural facilities in favour of under-privileged areas and this will help not only to promote the spirit of distributive justice but also it will go a long way to foster regional balance in our developmental efforts in the country.

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Table 1: Socio-Economic and Demographic Characteristics of Respondents

Variables	Categories	Frequency	%
Gender	Male	313	86.6
	Female	49	13.4
Age group (years)	20 – 25	37	10.1
	26 – 30	80	21.9
	31 – 35	122	33.4
	36 – 40	78	21.4
	41 – 45	32	8.8
	Over 46	16	4.4
Marital status	Single	9	2.5
	Married	339	92.8
	Separated	5	1.4
	Widowed/widower	12	3.3
Household size	0 - 5	123	33.7
	6 – 10	198	54.2
	11 – 15	36	9.9
	16 – 20	8	2.2
Education level	No formal education	39	10.7
	Primary education	221	60.5
	Secondary education	71	19.5
	Tertiary education	34	9.3
Major occupation	Farming	298	81.6
	Civil service	32	8.8
	Trading	35	9.6
Duration of Residence (Yrs	0 -5	3	0.8
	6 – 10	19	5.2
	11 – 15	11	3
	16 – 20	21	5.8
	21 – 25	30	8.2
	26 – 30	72	19.7
	Over 31	209	57.3

Source: Authors

Table 2: Standardized Score Values on Infrastructures by District

District	ZI	ZII	ZIII	ZIV	ZV	ZVI	ZVII	ZVIII	ZIX	ZX	Σ	Rank
K/Maga	0.11	2.41	0.12	2.12	2.76	1.21	1.04	2.73	0.45	3.45	16.18	1
Kufana	1.5	1.03	2.52	0.92	1.78	0.18	1.21	2.73	0.45	1.39	13.71	2
Idon	0.53	1.72	0.12	-0.23	0.79	0.44	1.94	-0.3	0.45	-0.02	5.44	3
Kalla	-0.11	0.69	2.12	1.32	-0.2	-0.33	1.63	-0.3	0.45	-0.21	3.68	4
Iri	-0.27	-0.34	-0.28	-0.23	-1.18	2.74	0.57	-0.3	0.45	-0.33	0.83	5
Iburu	-0.11	-0.69	-0.28	0.92	-0.2	-0.33	0.05	-0.3	0.45	-0.11	-0.6	6
Maro	3.11	-0.34	-0.68	-0.68	-0.2	0.08	0.09	-0.3	-1.82	-0.16	-0.9	7
Buda	-0.11	0.34	-0.68	-1.08	-0.2	1.21	-0.81	-0.3	0.45	-0.45	-1.63	8
Kutura	0.05	00	-0.28	-0.23	-0.2	0.44	0.22	-0.3	-1.82	-0.11	-2.23	9
Dawaki	-1.08	0.34	0.26	0.52	-0.2	-0.33	-1.32	-0.3	0.45	-0.62	-2.28	10
Rimau	-0.27	-1.03	-0.28	-0.68	-0.2	-0.59	-0.29	-0.3	0.45	-0.5	-3.69	11
D/gaiya	-0.11	-1.03	-0.28	-0.68	-0.2	-0.85	-0.42	-0.3	0.45	-0.55	-3.97	12
Sunka	-0.92	-0.34	-0.28	-1.08	-0.2	-1.43	-0.98	-0.3	0.45	-0.43	-5.51	13
Kajuru	-0.76	-0.69	-1.08	-1.08	-0.2	-1.43	-1.12	-0.3	0.45	-0.31	-6.52	14
U/ Aku	-0.44	-1.03	-0.28	-1.08	-1.18	-0.59	-0.64	-0.3	-1.82	-0.45	-7.81	15

Table 3: Condition of the Rural Infrastructures

Type of Infrastructure	Best		Better		Good		Poor	
	Fre	%	Fre.	%	Fre	%	Fre	%
Roads	--	--	23	6.3	85	23.3	257	70.4
Culverts	54	14.8	75	20.6	157	43.0	79	21.6
Boreholes	13	3.6	78	21.4	241	66.0	33	9.0
Schools	82	22.5	76	20.8	138	37.8	69	18.9
Health Centers	39	10.7	79	21.6	217	59.5	30	8.2
Cooperatives	73	20.0	91	24.9	148	40.6	53	14.5
Barns/stores	134	36.7	197	53.9	21	5.8	13	3.6
Ext. services	24	6.6	67	18.4	152	41.6	122	33.4
Rural energy	--	--	--	--	4	1.1	361	98.9
Wells	97	26.6	90	24.6	117	32.1	61	16.7

Source: Authors.

Table 4: Maintenance of the Infrastructures

Type of Infrastructure	State Govt.		Local Govt.		Community		Individual	
	Fre	%	Fre	%	Fre	%	Fre	%
Roads	96	26.3	78	21.4	291	52.3	--	--
Culverts	--	--	57	15.6	197	81.4	11	3
Boreholes	--	--	93	26.5	185	50.7	87	23.8
Schools	57	15.6	105	28.8	198	54.2	5	1.4
Health Centers	29	7.9	319	87.4	12	3.3	5	1.4
Cooperatives	39	10.7	73	20	253	69.3	--	--
Barns/stores	--	--	--	--	--	--	365	100
Ext. services	64	17.5	294	80.6	7	1.9	--	--
Rural energy	158	43.3	122	33.4	85	32.3	--	--
Wells	--	--	--	--	--	--	365	100

Source: Authors