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ASSESSMENT OF AVAILABILITY AND UTILIZATION OF RURAL PHYSICAL INFRASTRUCTURE IN KWARA STATE, NIGERIA

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ABSTRACT
The paper examined the availability and utilization of rural physical infrastructural facilities in Kwara State, Nigeria. The study was based on a cross-sectional survey of 160 respondents (cassava, rice and maize farmers) selected with a three-stage random sampling of communities across the four Agricultural zones in the State. Data were collected with interview schedule and analyzed with Analysis of Variance (ANOVA). The result revealed that most of the available rural physical infrastructures were obsolete, and that irrigation facilities were the least available in the study area. Concerning rural transportation facilities, it was found that railway was not available in the study area. Most of the available roads were earthen, with few tarred. This showed that there were inadequate rural transportation facilities in the Agricultural zones. Transportation facilities were highly utilized in the study area to transport agricultural produce to the market centers. Storage facilities level of utilization had 0.45 mean score, while irrigation facilities was the least. The rural physical infrastructures utilization rate in agricultural zone C was very low compared with zones D, B and A. Analysis of Variance showed significant difference in rural physical infrastructures utilization in zones A to D. Respondents in zone C rarely utilized rural physical infrastructures, while zone A had the highest level of utilization among the four agricultural zones. The study therefore, recommended that government should focus more attention on building dams, motorable road, bridges, storage and irrigation facilities across the agricultural zones. The Niger Basin Authority should be revitalized encourage irrigation farming during dry seasons to increase crop production and enhance food security in the State.
Keywords: Utilization, Physical infrastructures, Food storage, Irrigation farming, Food security.

INTRODUCTION

Agriculture is an important sector in the developing world. It contributes to economic growth and development as well as a major employer to majority of the people of Sub-Saharan Africa including Nigeria, especially those in the rural areas (Essays UK, 2018). Generally, infrastructure is essential for the sustainability of human settlement. Today, it is no longer arguable that the imbalances in the provision of rural infrastructure in most rural areas when compared with that of the cities have negatively impacted cities' sustainability. Therefore, improving accessibility to basic services such as safe water, electricity, sanitation, and social infrastructural facilities for residents has been acknowledged as one of the principal ways of promoting food security, sound human settlements, good health, appropriate and decent living conditions (Okorafor *et al*, 2014).

The importance of rural infrastructure such as rural physical infrastructure to a nation's development can be seen in that, once goods are produced, they need to be transported to the ports and airports for transportation to other states and countries. This simply means that excellent roads are needed to transport the goods or otherwise, they would be delayed leading to economic and reputational losses (Juneja, 2015*)*. Indeed, if farmers in the rural areas harvest their farm produce as soon as they are ready for harvesting it could leads to losses of such farm produce due to the perishability nature of most agricultural products. Also, if a manufacturer produces goods quickly but is unable to transport them to the destination as fast as they can, then there is no point in making the goods in an efficient manner in the first place.

However, in order to encourage increased production in rural areas, rural development may offer a package of inputs and welfare services for the rural masses. Such inputs and welfare services include physical inputs (such as the provision of feeder roads, water and electrification), social inputs (namely health and educational facilities) and institutional inputs such as credit facilities, agricultural research facilities, rural expansion services among others (Sharma, 2016). Availability of adequate infrastructure facilities is an important pre-requisite for sustainable economic and social development. They have multiple effects on health and quality of life.

Strengthening rural infrastructure through investment in rural infrastructure can lead to lower production costs which can further augment agricultural output and income for rural farming community.

Furthermore, dominance of poor is more in rural areas compared to urban areas. Therefore, any investment that helps to increase rural production, income and employment is expected to reduce poverty. Improvement in rural roads affects agricultural development positively as well as contributing to the development of social services. Therefore, more developed the existing agricultural system, the more significant and the faster is the response to road provision or road improvements within an area. Access to better health and education usually improves more rapidly along roads than elsewhere. The most significant justification of the large scale public investments in rural roads is to help the largely agrarian rural economy in exploiting the income opportunities for the farmers.

Limited access to infrastructures such as road and credit cuts small-scale farmers off from sources of inputs, equipment and new technology and so keeps yields low. Inadequate infrastructures also affect the level of productivity through ineffective time allocation, ineffective marketing and price transmission, thereby inhibiting full utilization of potentials of farm households (Ondiege *et al*., 2013).

This study considered rural physical infrastructural facilities and assessed the level of utilization of such rural physical infrastructural facilities by arable crop farmers in the four agricultural zones, in Kwara State. Specifically, the paper described the socio-economic characteristics of farmers, identified basic physical infrastructures available in the State, and ascertained the extent of utilization of these facilities. It was hypothesized that there is no significant difference in the level of utilization of rural physical infrastructures in the agricultural zones of Kwara State.

METHODOLOGY

Kwara State which is the area of study covers an area of 74.256 sq km of the total area of Nigeria (923,768 sq km), and has 16 Local Government Areas. The State is in the humid agro-ecological zone of Nigeria, and this has tremendous influence on its agro-climatic profile (rainfall, temperature etc), and agricultural potentials (crop and livestock diversity). The humid zone is one of the most vulnerable to climate change effect and this calls for policies and action that would mitigate such effects, including infrastructural provision.

The population of the study comprised of arable crop farmers in the four agricultural zones of Kwara State, Nigeria (Table 1).

Table 1: Selected L.G.A, Villages, Sample population

AGRIC. ZONE	L.G.A	VILLAGES	SELECTED SAMPLE
	Baruteen	Okuta	10
		Yashikira	10
A	Pategi	Danmaria Kpotun	10
		Tungaboki	10
	Edu	Bogungi	10
		Lafiagi	10
B	Kaima	Kaima	10
		Tsaragi	10
	Ilorin-South	Ile-apa	10
		Sentus	10
C	Oyun	Igbo-ita Erinle	10
		Oke-otin Ijagbo	10
	Asa	Budo-egba Igbon	10
		Ayekale-Oloola Otee	10
D	Ifelodun	Omupo	10
		Olujojo	10
Total 4	**8**	**16**	**160**

Source: Field survey, 2017

Three-stage sampling procedure was adopted. At the first stage, all the Agricultural Development Programme (ADP) zones were identified. This was followed by random selection of two Local Government Areas (LGA) from each of the zones and two villages selected randomly from each LGA. Finally, ten arable crop farmers were randomly selected from each village giving a total of 160 respondents. Primary data used were collected with the aid of structured questionnaire and interview schedule. This was supplemented with secondary information from textbooks, journals, dissertations and internet.

Data analysis involved use of descriptive (mean, frequency, percentage) and inferential tools (ANOVA). Socio-economic characteristics of respondents were ascertained using descriptive statistics such as frequency distribution and percentages. Data obtain were subjected to Analysis of Variance (ANOVA) to test the hypothesis of no difference respondents' utilization of rural infrastructures in the four agricultural zones of Kwara State.

RESULTS AND DISCUSSION

Analysis of the socio-economic characteristics of the arable crop farmers is presented on Table 2.

Socioeconomic Characteristics of Respondents

Personal and Socio-Economic characteristics considered in the study include age, sex, household size, farming experience and level of contact with extension. Majority of the respondents (82%) were males (Table 2) and within active years of 24-48 (61%). The modal age was between 26 and 48 years, while the mean was 46%. This implies that the respondents were at their active and productive working age hence their involvement in crop farming. Policy Research Initiative holds that the active population comprises all within the age of 15-54 years.

A large percentage of the respondents (91.2%) were married and half of this group (53.2%) had formal education. High level of education translates into higher level of understanding and adoption of agricultural innovations and consequently higher agricultural output. Farm sizes differed among respondents with average mean ($\bar{X}$) of 8.74 hactares. Majority of the respondents acquired their farmland by inheritance (59.38%), had vast farming experience ($\bar{x}$ 19 *years*),

practiced mixed cropping (76%), and had close contact with extension (86.30%). Extension visits afford farmers the opportunity to transmit the information necessary for improving farming practices.

Table 2: Personal and Socioeconomic Characteristics of Respondents

Characteristics	Category	Frequency (N=160)	Percentage (100%)	Mean ($\bar{X}$)
Sex	Male	131	81.9	
	Female	29	18.1	
Age bracket (years)	24-35	33	20.63	
	36-48	64	40.0	
	49-60	47	29.37	46.07
	>60	16	9.99	
Marital Status	Married	146	91.2	
	Single	12	7.5	
	Widowed/divorced	2	1.2	
Educational Level	No formal Education	75	46.8	
	Primary Education	39	24.4	
	Secondary Education	29	18.1	
	Tertiary Education	14	8.8	
	Adult Education	3tb	1.9	
Farming Experience	≤10	45	28.13	19.44
	11-20	57	35.62	
	21-31	33	20.62	
	31-40	25	15.62	
Household size	≤5	63	39.38	7.14
	6-10	76	47.50	
	11-15	19	11.87	
	>15	2	1.25	
Farm Size (ha)	≤5	69	43.13	8.74
	6-10	52	32.50	
	11-15	23	14.37	
	16-20	3	1.87	
	>20	13	8.13	
Minor occupation	Civil service	18	11.2	
	Trading	45	28.1	
	Business	39	24.4	
	Artisan	58	36.2	
Land Acquisition	Inheritance	95	59.38	
	Purchase	14	8.75	
	Rent/Lease	51	31.87	
Cropping pattern	Mono Cropping	38	23.75	
	Mixed Cropping	122	76.25	
Monthly Extension Visit	1-2	138	86.3	
	3-5	17	10.6	
	6-8	3	1.9	
	>9	2	1.2	

Source: Field survey, 2017

Respondents appear to be subsistence or small-scale farmers who all minor in other forms of occupation such as craftmen/artisans (36.2%), trading/businesses (52.5%) and (11.20%) especially during off-farm season.

Availability of Rural Physical Infrastructural Facilities

This section shows the available rural physical infrastructural facilities in the four agricultural zones in Kwara State.

(a) Rural transportation facilities

The Rural transportation facilities consist of footpath, feeder road, tarred road, bridges etc. The results obtained on the availability of transportation facilities are shown on Figure 1.

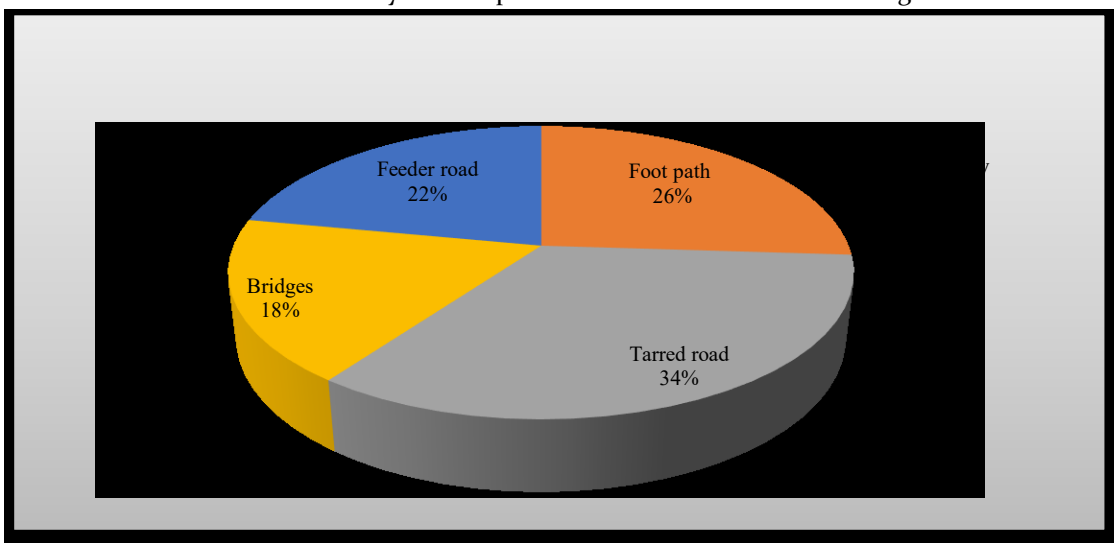

Figure 1: Availability of Rural Transportation Facilities in the Study area

Source: Field Survey, 2017

Rail transportation facility was not available in the study area. This coupled with the fact that the available motorable road was not readily available (34%) may probably have increased the cost of transportation or led to frequent spoilage of agricultural produce. Most of the available roads were earthen road, with few tarred roads. The available feeder road was about (22%) and foot-path (26%), while bridges and tarred road were just 18% and 34% respectively. It is, therefore, obvious that the arable crop farmers were suffering from inadequate rural transportation facilities (rural physical infrastructure) in their farming communities, a situation capable of hindering crop production and reducing farm profits.

(b) Irrigation facilities

The Irrigation facilities in the study area consisted of dam, sprinkler, drip and buried diffuser. The results obtained on the availability of irrigation facilities are shown on Figure 2.

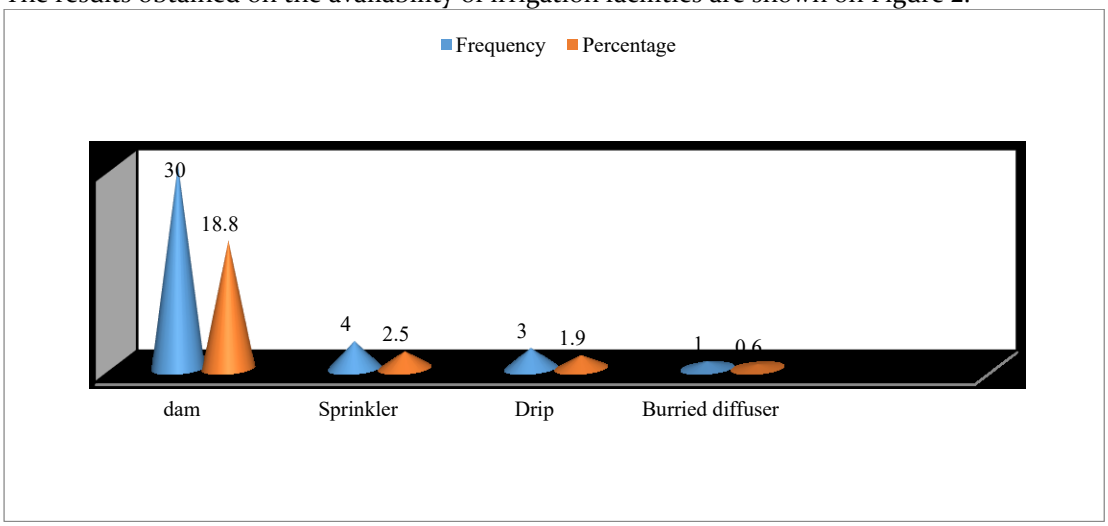

Figure 2: Availability of irrigation facilities in the study area
Source: Field survey, 2017
The result shows poor availability of irrigation facilities in the study area. Dams were more available to arable crop farmers (18.8%), followed by sprinkler available (2.5%), while drip and buried diffuser took 1.9% and 0.6% respectively. This shows that irrigation facilities were extremely under-utilized among the arable crop farmers. This is worrisome especially for Edu and Pategi Local Government area of Kwara State where farmers need regular water supply for rice production.

(c) Storage facilities
The Storage facilities consist of cribs, silo, barn and warehouse. The results obtained on the availability of storage facilities are shown on Figure 3.

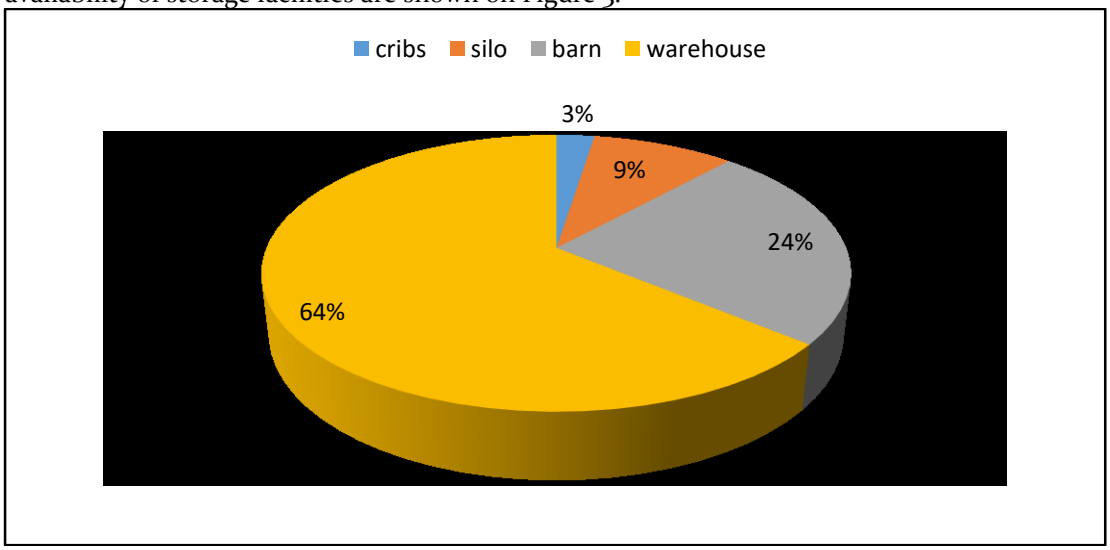

Figure 3: Availability of Storage Facilities in the study area
Source: Field Survey, 2017

Figure 3 shows the available storage facilities in the study area. The result shows that warehouse facility was available to the arable crop farmers. (64%) making it the most available facility. Moreso, the respondents made use of barn (24%) on their farm site and few of them had cribs and silos at (9%) and (3%).

Utilization of Rural Physical Infrastructural Facilities
From the results, transportation facilities were highly utilized by the respondents ($\bar{x} = 0.8$). This obviously facilitated marketing their farm produce. Lorries and motorcycle were mostly used in the area for transporting farm produce to the market.

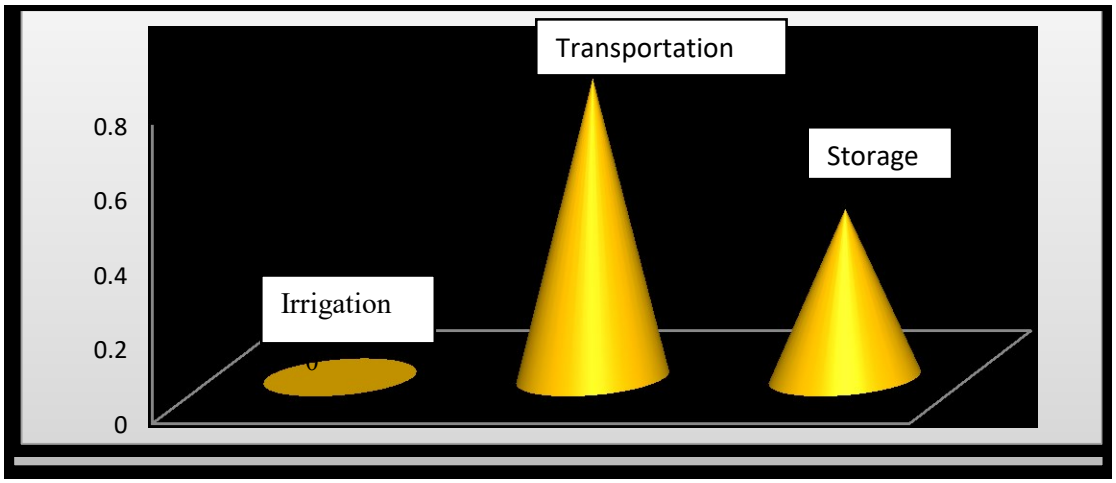

Figure 4: Utilization of Rural Physical Infrastructural Facilities in Zone A
Source: Field survey, 2017

Figure 4 shows the level of utilization (mean scores) of Rural Physical Infrastructural Facilities in Zone A. In term of utilization, Storage facilities($\bar{X}$=0.45) follows the transportation facilities, while irrigation facilities was the least utilized in zone A. Respondents virtually practiced rain-fed farming.

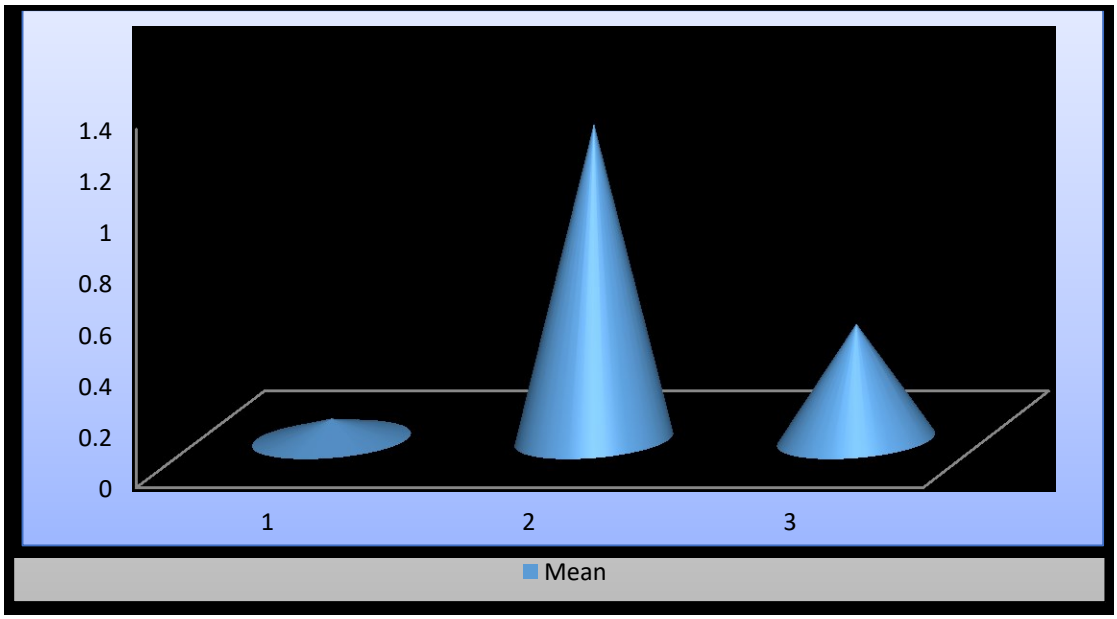

Figure 5: Utilization of Rural Physical Infrastructural Facilities in Zone B
Source: Field survey, 2017

Figure 5 shows the level of utilization of (mean score) rural physical infrastructural facilities in Zone B. Just as is the case in Agricultural zone A, transportation facilities level of utilization was very high, ($\bar{x} = 1.2$) thus facilitating in marketing their farm produce. Again, lorries and motorcycle were mostly used in transporting farm produce to the market. Storage facilities ($\bar{X}$= 0.45) followed the transportation facilities. This implies that storage facilities may have also further prevented losses of agricultural produce after. Respondents in zone B, findings show, have designated warehouse or barn in their farm location. Irrigation facilities utilization was very poor ($\bar{X}$= 0.08) and this usually affected respondent's level of production during dry season.

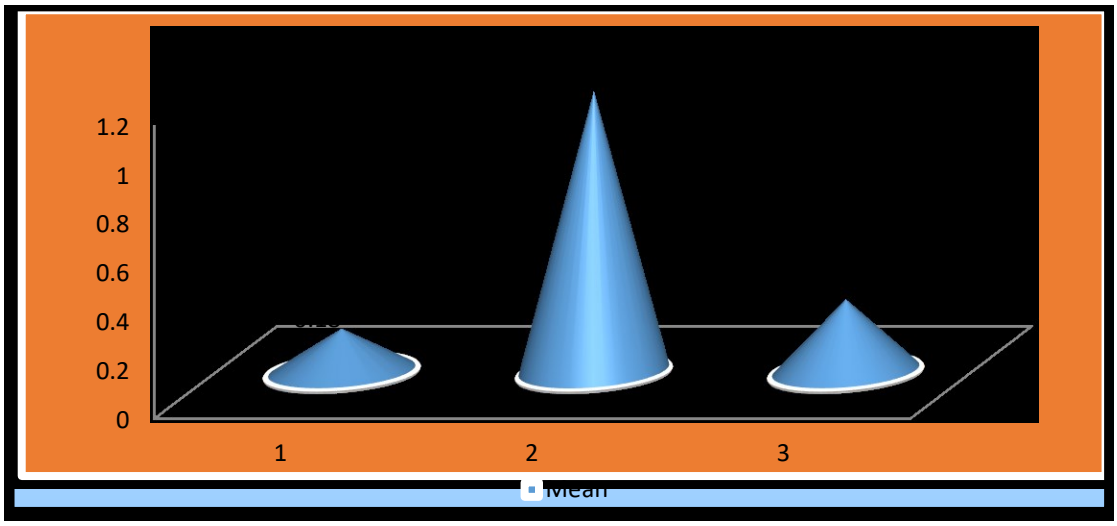

Figure 6: Utilization of Rural Physical Infrastructural Facilities in Zone C.
Source: Field survey, 2017

Figure 6 shows the level of utilization of rural physical infrastructural facilities in Zone C. The mean score that transportation facilities were most frequently utilized in Agricultural zone C ($\bar{X}$=1.15) but not the same level of utilization in zone B. Transportation facilities like lorry, motorcycle were also the transportation facilities mostly utilized. Storage facilities in term of level of utilization has ($\bar{X}$=0.45) and follows the transportation facilities. This shows that the level of utilization storage facilities is less than that of transportation facilities, but higher than irrigation facilities utilization.

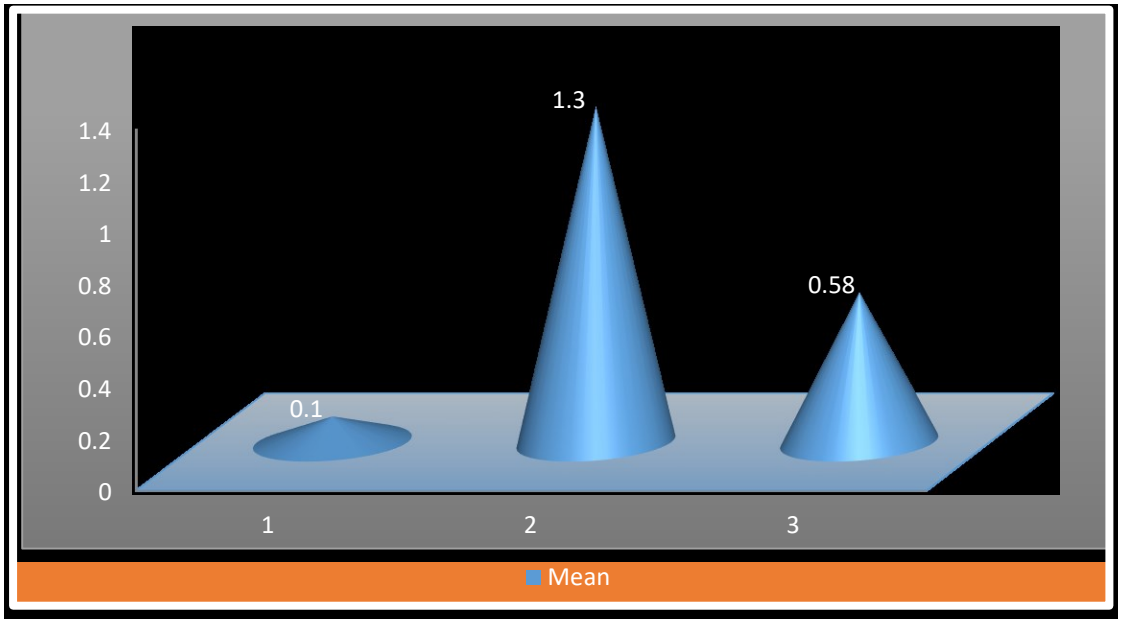

Figure 7: Level of Utilization of Rural Physical Infrastructural Facilities in Zone D
Source: Field survey, 2017

Figure 7 show the level of utilization of Rural Physical Infrastructural Facilities in Zone D. Transportation facilities utilization was also higher than Storage facilities like in Agricultural zone A, B and C. The zone had poor storage facilities available and so the only option was probably to market the produce. Also, that their irrigation know-how and its facilities cost was a

limiting factor for the arable crop farmers in that area. The zone lacked water bodies to irrigate their farm land properly.

Hypothesis Testing

The study went further to test if there is a significant difference between the utilization of rural physical infrastructural facilities across the agricultural zones. The results are presented on Table 2:

Table 2: Analysis of Variance showing the differences in Utilization of Rural Physical Infrastructures across the Agricultural Zones in Kwara State

Variables	Zone A	Zone B	Zone C	Zone D
Zone A		1.825± 0.302***	2.950± 0.302***	2.325± 0.302***
			1.125± 0.302***	0.500± 0.302
Zone B	-1.825± 0.302***			-0.625± 0.302
		-1.125± 0.302***		
Zone C	-2.950± 0.302***	-0.500± 0.302	0.625± 0.302	
Zone D	-2.325± 0.302***			
F – ratio	35.302***			

Source: Field survey, 2017. Note: Mean difference ± standard error, *** = 1 % level of significant.

The result in Table 2 shows that the utilization of rural physical infrastructure in zone A was different from zone B (1.825) which implies that the utilization of rural physical infrastructure in zone A was significantly higher than that of zone B. Zone A was also significantly high when compared with zone C and D (2.950) and (2.325) respectively at 1% significant level. This shows that zone A had the highest utilization of rural physical infrastructure when compared with the other zones.

However, the result on the Table further shows that zone B was different from zone C and D (1.125) and (0.500) respectively at 1% significant level. The positive mean difference in zones C and D implies that the utilization of rural physical infrastructure in the zone B was significantly higher compared to that of the zones C and D. Also, the utilization of rural physical infrastructure in zone C was different from zone A, B and D (-2.950), (-1.125) and (-0.625) respectively at 1% significant level. The negative mean difference across the zones implies that the utilization of rural physical infrastructure in zone C was significantly low compared to that of the other zones.

CONCLUSION

The study examined the availability and level of use of rural physical infrastructures by the arable crop farmers in Kwara State. Findings significant difference in availability and utilization of the rural physical infrastructural facilities in the farming communities. Variation in the availability of rural physical infrastructures and its usage in the zones by the arable crop farmers had a significant effect on their farm produce in each of the zones. The study concludes that low availability of rural physical infrastructural development and its utilization is capable of limiting the efforts at improving the arable crop production in the agricultural zones of the state. It is, therefore, recommended that government at different levels within the State of the Agricultural zones that are deficient in rural infrastructural facilities should work harder to integrate programmes and means of providing the rural infrastructures that will enhance agricultural production. Policies should also be directed towards improving the rural physical infrastructural facilities in the agricultural zones. These measures will go into a large extent enhance food security in the State.

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