Analysis of Intermediate Means of Transportation (IMT) in Burra District of Ningi Local Government, Bauchi State

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Abstract

The study area consist of seven wards which were categorised according to their accessibility to road before selection of a representation from each category. The IMT owned, showed that Burra (good access) has the highest number of motorcycle, horse and wheelbarrow followed by Kafin Lemo (moderately access) then Kurmi (poor access) with the least. IMT used for trip to farm was found that in Burra, majority used motorcycle followed by bicycle, then Animal drawn. Most of the activities done with IMT by rural dwellers for trip to farm in dry season is to convey manure from home to farm and collection of animal feeds from farm to home, while in rainy season IMT is used to transport harvested produce from farm to market or home. The used of IMT as the means of transport in the area act as an avenue for employment as well as source of income to individuals. The result of the formulated Hypothesis showed a statistically significant relationship between the types of IMT used and the road access, that is motorcycle at Burra; p = 0.014, bicycle p = 0.031 and animal drawn p = 0.005. At Kafin Lemo; motorcycle p = 0.012, bicycle p = 0.037 and animal drawn p = 0.009, and at Kurmi; motorcycle p = 0.010, bicycle p = 0.042 and animal drawn p = 0.014. This relationship implies that motorcycles were frequently used in good access and moderate roads than poor access; while bicycles and animal drawn were used frequently in poor access than good and moderate roads. However, there is no statistically significant relationship at Burra on; Horse p = 0.0580, Donkey p = 0.615, Camel p = 0.675 and Wheelbarrow p = 0.568. At Kafin Lemo Horse p = 0.0582, Donkey p = 0.614, Camel p = 0.677 and Wheelbarrow p =

0.572. At Kurmi Horse p = 0.0576, Donkey p = 0.620, Camel p = 0.667 and Wheelbarrow p = 0.578. The results implies that the respondents irrespective of the nature of the road rarely used these types of IMT. However, the null hypothesis was rejected and therefore a conclusion was made that there is a significant relationship between the type of IMT used and the road access.

Introduction

The importance of transport facilities in rural areas can be justified from both social and economic perspectives. Socially, a significant proportion of Nigeria population lives in the rural areas and demands various forms of transport to facilitate socio-political interactions. Secondly, the rural areas are indispensable in the supply of food, raw materials to urban centres and the country's economic growth as a whole. In any rural society, influence of rural transport on the patronage of rural markets plays a pivotal and often a decisive role in determining the overall productivity and development of a rural economy as well as the quality of life of its dwellers. In rural areas throughout the world, agriculture represents the predominant land use and a major component of the viability of rural areas. Farming and related activities make up the basic fabric of rural life, contributing significantly to the overall state of regions in terms of employment and business opportunities, infrastructure and quality of the environment.

Rural areas have from time immemorial been homes for the economy of Nigeria but the country has failed to develop these areas that have made it relevant in the world economy. Nyagba (2009) made it known that the most crucial sector of the Nigerian residents is the rural communities due to the fact that they form a principal source of capital for the country and they also form a major source of raw materials for industrial processes. This was also supported by Musa (2010) who noted that rural areas have always been known to source their income from the economic activities like agriculture which constitutes the bedrock of Nigeria's economic development. Rural areas have been useful and important to Nigeria. Even in developed societies, farm produce still serve as the basis for the manufactured foods even though they have managed to develop synthetic food items successfully. Almost all natural resources that make up nation's wealth are extracted from rural areas: Flour mills, rice shelters, bread, milk products, oil and similar mills, meat, wineries, leather mills textile among other industries are based majorly on agricultural products which makes rural areas the home for natural resources. IMT, primarily provide some types of short distance services where they serve as feeders to urban centers and sometimes the roughness of the route may be unattractive to other mode of transport. They also complement taxis and large capacity bus services in the remote areas from the main roads where large capacity buses or trucks cannot operate, (like Burra district).

A review of some of the studies done shows that, Fasakin (2001) did a study on the factors affecting the daily profits of commercial motorcycle operators in Akure, the capital of Ondo State, South West of this country. Oluwaseyi, Ademiluyi and Adebayo (2016), studied the transportation of agricultural produce in Ijebu north local government area of Ogun state. The study was an investigation of the effect of means of transport (motor bike, bus, pick-up van and car) toward enhancing agricultural products in the study area. Another study by Maiwa and Yusuf (2014) on the use of motorcycle as means of public passenger traffic in Yola town, Adamawa State. The study identified economic depression and inadequate transport facilities as some of the factors that gave rise to the use of motorcycles as means of public transportation in Nigeria. An empirical

study on the uses of tricycle as a public transport mode in Nigerian cities by Dike (2012) shows that tricycle is far greater than bus and taxi in convenience, reliability, safety, fare and flexibility. Comfort (2012), did her study on the Effect of Socio-economic survival of Okada Riders. The findings showed that Okada riding, though a lucrative enterprise has its direct and indirect bearing on the cultural values of the society. Majority of the riders engaged in the business because of the pressing need to survive and sustain their families. Adetunji (2015) studied the evolution of motorcycles for public transportation in Ibadan. The study focus on the socio-economic profiles of motorcycle operators, the characteristics of public motorcycles operations and the impact of motor bikes on passengers especially in terms of fares and safety. Among other issues, the study looked at the rise in the use of Okada for public transportation in Nigeria pointing out that the decrease in the supply of new vehicles of all types since the 1970s contributed to the emergence of motorcycles for commercial transportation. Despite these obvious merits, IMT have tended to be ignored by economic planners and policymakers in the formulation of policy and positively discouraged the service providers. This study therefore, seeks to make an analysis of IMT in Burra district, Ningi LGA of Bauchi State.

Research Hypotheses

The following hypothesis was formulated and tested in this study:

H_0: There is no significant relationship between the types of IMT used in the three different locations.

Study Area and Research Methods

Study Area

Burra district is located North-West of Ningi town, it is bordered by Kano State; Sumaila local government area to the North-West, Tudun wada and Doguwa local government areas to the West and Takai local government area to the North and Toro local government of Bauchi state to the South. The geographical coordinates of the study area are 8° 24' 0", 9° 10' 0" North and 10° 30' 0", 11° 13' 0" East (Satellite Imagery, 2018). Figure 1.

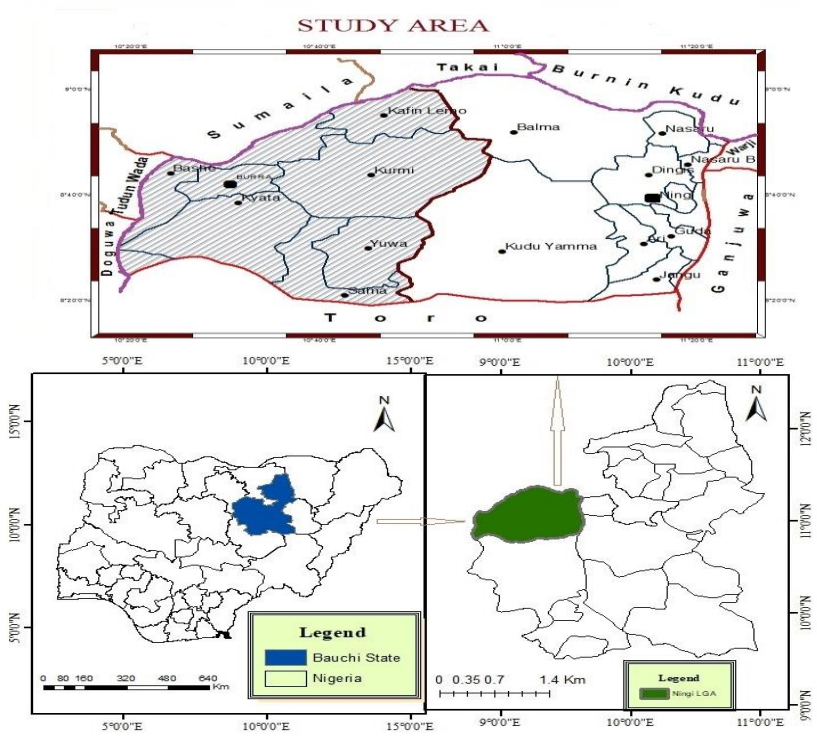

Fig. 1: Map of Ningi L. G. A Showing the Study Area.

Human Setting

Burra district is one of the four (4) districts in Ningi Emirate, it comprises of seven (7) wards or administrative sub-divisions: Kurmi, Sama, Kafin Lemo, Yuwa, Bashe, Kyata and Burra. Burra district is a majorly agrarian society known for the cultivation of a number of crops and the rearing of a variety of animals. Cattle and other livestock are also reared in the district. According to the National Population Commission (NPC 2022) the population of Burra district was estimated at 259,318 that is 37.2% of the population of Ningi local government and the area is inhabited mostly by Butawa, Hausawa and Fulani people (Abubakar, 2007).

Markets

Musissika is an important town within the study area, it is a village in the study area that provides market for agricultural produce which is not on a specific commodity, and there are a variety of different products. Most small scale farmers sell their produce in musissika market, whereas the large scale farmers take their produce to Nasaru, Gadar Maiwa, within the local government, Takai, Sumaila or Dawanau market in Kano state, since they produce for large market and for export.

Transport Network and its Accessibility

Most of the roads in Burra district are impassable especially during the rainy seasons, hence movements within the district to major roads is hindered. The total classified road network is 211 Kilometers of which over 80 percent are feeder roads. The bitumen surface in the study area, stand at 102 Kilometers, covering mainly from Ningi to Burra and Kyata through Bashe and 39 kilometers from Burra to Sumaila Local Government in Kano state, (Abubakar 2007). The gravel surface stands at 9.4 Kilometers from Takai Local Government of Kano state to Kafin Lemo and all other roads in the study area are untarred having natural earth or at best gravel surface (Isma'il,

2009). In fact, most of the settlements are more than 20 kilometers away from the only tarred road. For instance, Ganji is about 21 kilometers away, while Sama is about 48 kilometers and Yuwa and Yadagungume are about 35 kilometers and 42 kilometers away respectively, Kafin Lemo is 38 kilometers away to the only tarred road and 9.4 kilometers to Takai Local Government of Kano State and Kurmi is about 33 kilometers away. Majority of the people in the study area are farmers and their distance away from the only tarred road within the study area necessitate the use of IMT from home or farm to the tarred road or markets for the transportation of agricultural produce and from market to farm for transport of agricultural inputs, which increased the price of the agricultural produce. Fig. 2 shows the road network in the study area.

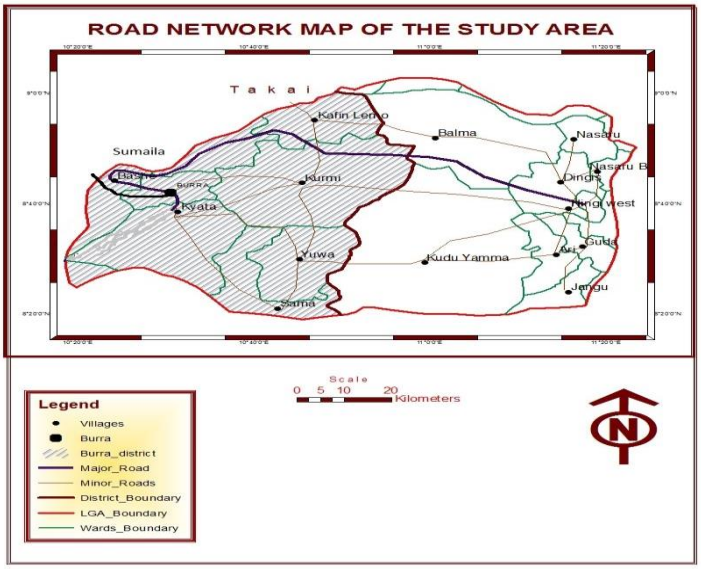

Figure 2: Road network of the Study Area.

Methods

Strategies for Data Collection

Data collection is viewed as a method of obtaining information needed for testing of hypotheses or answering research questions. In order to gain recognition in the presence of respondents of all the selected wards within the study area, thereby have access to the households, introduction of the purpose of the study was made to the village head (Dagachi) and community leader (mai unguwa) so as to carry out the study. The instrument was administered with the help of three trained research assistants, where households were interviewed based on the questions designed for this study.

Selection of Study Area

The study area consists of seven wards or sub-administrative division, which was categorised on the basis of accessibility to road. Roads connecting the wards or the sub-administrative divisions were found to have fallen within four of Anderson's (1995) six road categories. It is therefore possible to determine the functionality of the roads throughout the year. As indicated in Table 1, the study area was categorised into (3) three main categories; good, moderate and poor.

Table 1: Classification of wards according to access characteristic

Description	Route Access	Wards
Good	Reliable access all year to all vehicles.	Burra, Kyata and Bashe
Moderate	Passable by two wheel vehicles all year. Often closed by four wheel drive vehicles When wet.	Kafin Lemo
Poor	Passable by four wheel Drive Vehicles When dry. Impassable by two wheel Drive vehicles when wet.	Sama, Yuwa and Kurmi

(Based on Anderson's 1995, classification)

As clearly shown in Table 1, one ward can be accessed by two-wheel drive vehicles all year round but often closed by four-wheel drive vehicle when wet and all the roads connecting three wards (Burra, Bashe and Kyata) has reliable access all year to all vehicles while the remaining three wards (Sama, Yuwa and Kurmi) are connected by roads either completely impassable or often closed to two-wheel drive vehicles when wet. This implies that vehicular travel is highly restricted by poor road surface conditions especially from Yuwa, Sama and Kurmi to the only tarred road in the study area. Rural travel between these three wards during the wet season are mostly by the use of motorcycles, bicycles and with very few animal drawn vehicles. This places great restrictions on mobility with attendant negative effects on the economy and general wellbeing of the people. Three wards were selected as the study area, one from each category of road access; Burra from good access, Kafin Lemo from moderate access and Kurmi from a poor access. To avoid being bias, simple random sampling was used in selecting one ward each, from good access road and poor access road.

Results and Discussion

Spatial Distribution and Ownership of IMT

Table 2: Type of IMT Owned in Burra District

MODE OF TRANSPORT	BURRA N=110		KAFIN LEMO N=124		KURMI N=166		TOTAL	
	no	%	no	%	no	%	no	%
Motorcycle	76	69.1	61	49.2	37	22.3	174	43.5
Bicycle	12	10.9	17	13.7	43	25.9	72	18.0
Animal Drawn	11	10.0	33	26.6	67	40.4	111	27.8
Horse	4	3.6	3	2.4	1	0.6	8	2.0
Donkey	2	1.8	4	3.2	11	6.6	17	4.3
Camel	0	0.0	3	2.4	5	3.0	8	2.0
Wheelbarrow/ hand cart	5	4.5	3	2.4	2	1.2	10	2.5
Total	**110**	**100.0**	**124**	**100.0**	**166**	**100.0**	**400**	**100.0**

Source: Fieldwork, 2023

The result from Table 2: showed that Burra (good access) has the highest number of respondents who owned motorcycle, horse and wheelbarrow followed by Kafin Lemo (moderately access) then Kurmi (poor access) with the least. The respondents that owned bicycle, donkey, camel and animal

drawn cart are higher in Kurmi (poor access) followed by Kafin Lemo (moderate) and finally Burra (good access). The Table also indicates that, majority of the respondents owned motorcycle 43.5% followed by animal drawn cart with 27.8%, while 18.0% of the respondents owned bicycle. The respondents who owned wheelbarrow/hand cart 2.5%, donkey 4.3% and camel 2.0% are the least. This means that most of the respondents owned motorcycle, animal drawn and bicycle as their means of transport and very few of the owned donkey, horse, camel and wheelbarrow/hand cart. There are two major ways by which the people acquire the IMT that is through inheritance and through the sale of farm produce.

The Temporal use of IMT to Activity Locations

IMT for Trip to Farm

Table 3: shows the types of IMT used in different seasons for trip to farm. The Table revealed that in Burra, 62.7% of the respondents used motorcycle for trip to farm during dry seasons followed by those who used bicycle with 15.5% of the respondents, Animal drawn account for 11.8% of the respondents for trip to farm, donkey with 6.4% and wheelbarrow/Hand cart account for 3.6%. In the same vein, motorcycle is majorly used in rainy season in Burra with 62.7%, Kafin Lemo with 61.3% while animal drawn cart is majorly used in area of poor access (Kurmi) with 37.3%. Motorcycle is majorly used in Kafin Lemo the (moderate access) followed by Burra the (good access) in both dry and rainy seasons. Animal drawn, bicycle and donkey are majorly used in Kurmi the (poor access) followed by Kafin Lemo the (moderate access) then Burra the (good access) in rainy season. In dry season bicycle and donkey are the most used in Kurmi then Burra and finally Kafin Lemo. Most of the activities done with IMT by rural dwellers for trip to farm in dry season is to convey manure from home to farm and collection of animal feeds from farm to home, while in rainy season IMT is used to transport harvested produce from farm to market or home. This research findings disagree with Andrew (2018), who carried a research on effect of bad road transportation system in Gushegu district of northern Ghana, his findings revealed that motorcycle is the most frequently used for trip to farm followed by bicycle irrespective of the season and road condition.

Table 3: Types of IMT used for trip to farm.

Means of Transport	**BURRA N=110**				**KAFIN LEMO N=124**				**KURMI N=166**			
	Dry season		**Rainy season**		**Dry Season**		**Rainy season**		**Dry Season**		**Rainy Season**	
	no	**%**	**no**	**%**	**no**	**%**	**no**	**%**	**no**	**%**	**no**	**%**
Motorcycle	69	62.7	62	63.7	76	61.3	43	59.3	59	35.5	45	27.1
Bicycle	17	15.5	11	14.5	12	9.7	21	11.7	38	22.9	39	23.5
Animal Drawn Cart	13	11.8	30	10.8	25	20.2	39	20.2	46	27.7	62	37.3
Horse	0	0.0	0	0.0	3	2.4	4	2.4	1	0.6	2	1.2
Donkey	7	6.4	7	7.6	4	3.2	11	3.2	22	13.3	18	10.8

Camel	0	0.0	0	0.0	1	0.8	0	0.0	0	0.0	0	0.0
Wheelbarrow / Hand Cart	4	3.6	0	3.4	3	2.4	5	3.2	0	0.0	0	0.0
Total	**110**	**100.0**	**110**	**100.0**	**124**	**100.0**	**124**	**100.0**	**166**	**100.0**	**166**	**100.0**

Source: Fieldwork, 2023

For Collection of House Needs

Table 4, revealed that in Burra more than half of the respondents 57.3% used motorcycle followed by bicycle 20.0%, then animal drawn cart with 11.8% then wheelbarrow 7.3% and finally donkey with 3.6% of the respondents who used them for collection of house needs during dry season, while during rainy season motorcycle account for 56.3% followed by bicycle with 19.0%, animal drawn with 12.8%, wheelbarrow with 6.3% and finally donkey with 5.6%. In Kafin Lemo during dry season majority of the respondents used motorcycle with 54.0% of the total responses followed by Animal drawn which account for 19.4%, bicycle with 15.3%, Donkey Camel and Wheelbarrow account for 7.5%, 3.4% and 1.4% respectively. The trend is still the same during rainy season but with difference percentage, motorcycle 52.0%, Animal drawn 18.4%, bicycle 17.3%, Donkey 7.5% Camel 3.4% and Wheelbarrow 1.4%. The Table further revealed that in Kurmi the poor access, Animal drawn is majorly used during rainy season with 42.8% of the responses followed by motorcycle which account for 31.3% then bicycle with 15.1% and Donkey with 10.8% of the responses. But in dry season motorcycle is majorly used with 34.3% followed by Animal drawn with 28.9%, bicycle with 24.7% Camel and Donkey account for 6.6% and 5.4% respectively. Collection of house needs in rural areas include; collection of firewood, water, blocks and sand for buildings, etc. Animal drawn cart, Donkey and Bicycle are the most used in Kurmi followed by Kafin Lemo in both rainy and dry season, motorcycle is the most used in Kafin Lemo than Burra in dry seasons, but in rainy season motorcycle is the most used in good and poor access (Burra and Kurmi) than the moderate access (Kafin Lemo).

Table 4: IMT used for collection of house needs.

Means of Transport	BURRA N=110				KAFIN LEMO N=124				KURMI N=166			
	Dry season		Rainy season		Dry Season		Rainy season		Dry Season		Rainy Season	
	no	%	no	%	no	%	no	%	no	%	no	%
Motorcycle	63	57.3	51	56.3	67	54.0	49	52.0	57	34.3	52	31.3
Bicycle	22	20.0	27	19.0	19	15.3	22	17.3	41	24.7	25	15.1
Animal Drawn Cart	13	11.8	15	12.8	24	19.4	30	18.4	48	28.9	71	42.8
Horse	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Donkey	4	3.6	7	5.6	8	6.5	14	7.5	9	5.4	18	10.8
Camel	0	0.0	0	0.0	4	3.2	0	3.4	11	6.6	0	0.0
Wheelbarrow/ Hand Cart	8	7.3	10	6.3	2	1.6	9	1.4	0	0.0	0	0.0
Total	**110**	**100.0**	**110**	**100.0**	**124**	**100.0**	**124**	**100.0**	**166**	**100.0**	**166**	**100.0**

Source: Fieldwork, 2023

IMT used for Trip to Markets

Table 5 indicate that Burra motorcycle account for 64.5% followed by bicycle with 13.6%, of the responses, wheelbarrow/hand cart, animal drawn and Donkey are also used for trip to market in dry season but at a very low percentage. The trend is the same in rainy season but with different percentage, motorcycle account for 63.5% followed by bicycle with 16.6%, wheelbarrow/hand cart with 9.0% animal drawn with 7.0% and Donkey with 5.9%. In Kafin Lemo, motorcycle is majorly used followed by animal drawn then bicycle in both rainy and dry season. In Kurmi the poor access motorcycle is the most used in dry season with 36.7% followed by animal drawn with 30.7%, bicycle and Donkey with 15.1% each and Horse and Camel with 1.2% each. In rainy season animal drawn is majorly used with 42.8% followed by motorcycle with 22.3% then bicycle with 21.1%, Donkey and Camel are also used with 9.0% and 4.8% for trip to market in rainy season respectively. In term of location, the good access (Burra) used motorcycle, and wheelbarrow more than any location. The poor access (Kurmi) used animal drawn, bicycle and donkey more, followed by the moderate access (Kafin Lemo) in both dry and rainy seasons.

The used of IMT as the means of transport in the area act as an avenue for employment as well as source of income to individuals. Some respondents added that IMT serves as the only means of transport that linked one village and another. This finding agrees with Ameso (2011), his findings also revealed that motorcycle frequently used for trip to market followed by bicycle in the area with good and moderate access road, but in poor access road animal drawn and hand cart are majorly used.

Table 5: IMT used for Trip to Market
Source: Fieldwork, 2023

Means of Transport	**BURRA N=110**				**KAFIN LEMO N=124**				**KURMI N=166**			
	Dry season		**Rainy season**		**Dry Season**		**Rainy season**		**Dry Season**		**Rainy Season**	
	no	**%**	**no**	**%**	**No**	**%**	**no**	**%**	**no**	**%**	**no**	**%**
Motorcycle	71	64.5	59	63.5	67	54.0	47	52.0	61	36.7	37	22.3
Bicycle	15	13.6	11	16.6	17	13.7	21	12.7	25	15.1	35	21.1
Animal Drawn Cart	8	7.3	33	7.0	28	22.6	40	24.6	51	30.7	71	42.8
Horse	0	0.0	0	0.0	0	0.0	0	0.0	2	1.2	0	0.0
Donkey	6	5.5	3	5.9	5	4.0	11	6.0	25	15.1	15	9.0
Camel	0	0.0	0	0.0	4	3.2	0	3.2	2	1.2	8	4.8
Wheelbarrow / Hand Cart	10	9.1	4	9.0	3	2.4	5	1.4	0	0.0	0	0.0
Total	**110**	**100.0**	**110**	**100.0**	**124**	**100.0**	**124**	**100.0**	**166**	**100.0**	**166**	**100.0**

Means of Transport Used in Accessing Places
Table 6, describes the means of transport used in accessing places like Market, Farm, Health care Center, Grinding Mills, Place of Worship, Collection of Harvest, Collection of Inputs, Collection of Firewood and Collection of Water within the study area.
The IMT used by the respondents in accessing farm are motorcycle, bicycle, animal drawn cart and donkey as indicated in the Table, the Table also revealed that about one-third of the respondents used motorcycle, animal drawn cart and bicycle as the third means of transport used by the respondents and very few respondents used donkey in accessing farm.

The Table further revealed that more than half 59.2% of the respondents used motorcycle as a mean of transport to market followed by bicycle with 25.1% of the respondents, animal drawn cart and Donkey are also used as a means of transport to market but at a very low percentage 9.4% and 6.3% respectively. The Table also shows the IMT used by the respondents to health care centers about half of the respondents used motorcycle, followed by bicycle with about one-third of the responses, animal drawn cart are also used by the respondents as a means of transport to health care center but usually it is used in transporting pregnant women on labour.
Furthermore, the Table indicated that majority of the respondents used motorcycle to places of worship with more than 80% of the respondents, followed by bicycle with about one-tenth of the respondents. Horse, camel and donkey are used as a means of transport to places of worship but at a very low percentage 4.2%.
The Table also revealed the means of transport used for collection of domestic needs by the respondents, majority of the respondents used bicycle to grinding mills and collection of firewood,

CHARACTERISTICS	Motorcycle	Bicycle	Animal Drawn	Donkey	Horse	Camel	Wheelbarrow/ hand cart	TOTAL
Farm	52	26	51	5	-	-	-	134
%	38.7	19.4	38.1	3.8	-	-	-	100
Market	113	48	18	12	-	-	-	191
%	59.2	25.1	9.4	6.3	-	-	-	100
Health Center	51	33	20	-	-	-	-	104
%	49.0	31.7	19.3	-	-	-	-	100
Place of Worship	121	12	-	2	6	3	-	144
%	84.0	8.3	-	1.4	4.2	2.1	-	100
Grinding Mill	12	22	-	2	-	-	-	36
%	33.3	61.1	-	5.6	-	-	-	100
Collection of Water	8	11	12	8	-	-	29	68
%	11.8	16.2	17.7	11.8	-	-	42.5	100
Collection of Firewood	9	16	4	9	-	-	-	38
%	23.7	42.1	10.5	23.7	-	-	-	100
Collection of Harvest	17	13	173	52	-	-	-	255
%	6.7	5.1	67.8	20.4	-	-	-	100
Collection of Input	52	9	63	12	-	-	-	136
%	38.2	6.6	46.3	8.9	-	-	-	100
TOTAL	**435**	**190**	**341**	**102**	**6**	**3**	**29**	**1106**
%	**39.33**	**17.18**	**30.83**	**9.22**	**0.54**	**0.27**	**2.62**	**100**

followed by motorcycle, but for collection of water majority used wheelbarrow followed by animal drawn cart and bicycle. Donkey is also used for grinding mills but by very few respondents.

Table 6: Means of transportation used in accessing places
Source: Fieldwork, 2023

Result of Hypotheses Testing

Results of Multiple Linear Regression showed a statistically significant relationship between the types of IMT used in the three different locations and the road access, the result shows that; at Burra motorcycle p = 0.014, bicycle p = 0.031 and animal drawn p = 0.005. At Kafin Lemo; motorcycle p = 0.012, bicycle p = 0.037 and animal drawn p = 0.009, and at Kurmi; motorcycle p = 0.010, bicycle p = 0.042 and animal drawn p = 0.014. These relationship implies that motorcycles were frequently used in good access and moderate access roads than the poor road; while bicycles and animal drawn were used frequently on poor access road than good and moderate roads. However, there is no statistically significant relationship at Burra on; Horse p = 0.0580, Donkey p = 0.615, Camel p = 0.675 and Wheelbarrow p = 0.568. At Kafin Lemo Horse p = 0.0582, Donkey p = 0.614, Camel p = 0.677 and Wheelbarrow p = 0.572. At Kurmi Horse p = 0.0576, Donkey p =

0.620, Camel p = 0.667 and Wheelbarrow p = 0.578. The results implies that the respondents irrespective of the nature of the road rarely used these types of IMT.

Traffic Count

The traffic data were collected from two (2) locations within the study area (Burra and Kurmi) as they are the only places with high traffic in the study area, it was done between 7.00 am to 7.00 pm for seven days, of which it gives a good representation on the volume of traffic in the study area. The data collected estimate the traffic flow based on time and days including the market days. Table 7, illustrates the traffic tally for stations 1 (Burra). From the study data it was observed that majority of the IMT within the area are motorcycles and bicycle with animal drawn transport taking the third slot at stations 1 (Burra). It further revealed that majority of the volume of traffic is higher in the evening between 3:00 pm to 7:00 pm as it is the time that most of the people in the areas engaged in trip for visit to relatives, trip from places of occupations and from shopping. In the morning between 7:00 am to 11:00 am the traffic volume is moderate but as it is the time by which the people engage in trip to place of work, but the traffic volume is low between 11:00 am to 2:00 pm. It was also observed that the IMT with the highest volume of traffic is motorcycle followed by bicycle then animal drawn, horse and camel has the least volume of traffic.

Table 7: Traffic Tally summary for station 1 (Burra)

INTERMEDIATE MEANS OF TRANSPORT (IMT)									
TIME	AUTO RICKSHAW	MOTOR CYCLE	BICYCLE	ANIMAL DRAWN	HORSE	DONKEY	CAMEL	WHEEL BARROW /HAND CART	**TOTAL**
7:00 to 8:00	-	9	2	-	-	-	-	1	**12**
8:00 to 9:00	-	18	3	3	-	1	-	2	**27**
9:00 to 10:00	-	17	2	1	-	1	-	-	**21**
10:00 to 11:00	-	8	1	1	1	-	1	1	**13**
11:00 to 12:00	-	7	1	1	-	1	-	-	**10**
12:00 to 1:00	-	6	1	2	-	-	-	-	**9**
1:00 to 2:00	-	7	2	1	-	1	-	-	**11**
2:00 to 3:00	-	15	2	3	-	-	-	1	**21**
3:00 to 4:00	-	10	2	1	1	1	1	2	**18**
4:00 to 5:00	-	22	3	2	1	2	-	2	**32**
5:00 to 6:00	-	15	3	2	-	2	1	2	**25**
6:00 to 7:00	-	27	4	2	-	3	-	1	**37**

TOTAL	**-**	**161**	**26**	**19**	**3**	**12**	**3**	**12**	**236**

Source: Fieldwork, 2023

Table 8. illustrated the traffic volume at station 2 (Kurmi), from the Table it clearly showed that the traffic volume is higher in the morning between 8:00 am to 11:00 am and in the evening between 4:00 pm to 7:00 pm, this indicated the time that majority of the people engaged in trip to farm, trip for collection of domestic needs, visiting friends and relatives. The Table further revealed that between 11:00 am to 4:00 pm the traffic flow is low. In term of traffic volume of this station, it is the same with that of station 1 where the motorcycle has the highest volume of traffic followed by bicycle then animal drawn, the traffic volume of donkey and wheelbarrow is moderate while, horse and camel has the least volume of traffic.

Table 8. Traffic Tally summary for station 2 (Kurmi)

INTERMEDIATE MEANS OF TRANSPORT (IMT)									
TIME	AUTO RICKSHAW	MOTOR CYCLE	BICYCLE	ANIMAL DRAWN	HORSE	DONKEY	CAMEL	WHEEL BARROW /HAND CART	**TOTAL**
7:00 to 8:00	-	9	1	1	-	-	-	-	**11**
8:00 to 9:00	-	19	2	1	-	-	-	-	**22**
9:00 to 10:00	-	26	6	3	-	1	-	-	**36**
10:00 to 11:00	-	22	5	2	1	1	-	1	**32**
11:00 to 12:00	--	17	2	1	-	-	-	1	**21**
12:00 to 1:00	-	9	2	1	-	-	-	-	**12**
1:00 to 2:00	-	6	2	1	-	-	1	1	**11**
2:00 to 3:00	-	9	3	2	1	-	-	2	**17**
3:00 to 4:00	-	11	3	3	-	1	1	-	**19**
4:00 to 5:00	-	18	4	3	-	1	-	2	**28**
5:00 to 6:00	-	27	3	2	2	2	-	1	**37**
6:00 to 7:00	-	29	2	3	-	2	-	3	**39**
TOTAL	**-**	**202**	**35**	**23**	**4**	**8**	**2**	**11**	**285**

Source: Fieldwork, 2023

From the findings, it was noted that there were more commercial motorcycles in the afternoon than there were in the morning at both the station, but on Friday as it is the market day at station 1 (Burra) the traffic was higher between 9:00 am to 11:00 am and 4:00 pm to 6:00 pm, while at station 2 (Kurmi) it was higher on Thursday the market day, between 10:00 am to 2:00 pm and

5:00 pm to 6:00 pm. Of concern to the research was that most of the motorcycles had the driver and two passengers on market days.

Conclusion

Majority of the people in the study areas are farmers, therefore adequate IMT has desirable influence not only on the agricultural production but also on the entire socio-economic development of Burra district. IMT contribute to the livelihood of the people within the study area as; collection of water, grinding mills and collection of firewood, majority use wheelbarrow followed by animal drawn cart and bicycle. Donkey is also used for grinding mills but by very few respondents. Motorcycle is majorly use to health care center, followed by bicycle, animal drawn cart are also used as a means of transport to health care center but usually it is used in transporting pregnant women on labour. Furthermore, motorcycle is majorly used to places of worship, followed by bicycle. Horse, Camel and Donkey are used as a means of transport to places of worship but at a very low percentage.

The formulated Hypothesis; The result showed a statistically significant relationship between the types of IMT used and the road access, that is motorcycle at Burra; $p = 0.014$, bicycle $p = 0.031$ and animal drawn $p = 0.005$. At Kafin Lemo; motorcycle $p = 0.012$, bicycle $p = 0.037$ and animal drawn $p = 0.009$, and at Kurmi; motorcycle $p = 0.010$, bicycle $p = 0.042$ and animal drawn $p = 0.014$. This relationship implies that motorcycles were frequently used in good access and moderate roads than poor access; while bicycles and animal drawn were used frequently in poor access than good and moderate roads. However, there is no statistically significant relationship at Burra on; Horse $p = 0.0580$, Donkey $p = 0.615$, Camel $p = 0.675$ and Wheelbarrow $p = 0.568$. At Kafin Lemo Horse $p = 0.0582$, Donkey $p = 0.614$, Camel $p = 0.677$ and Wheelbarrow $p = 0.572$. At Kurmi Horse $p = 0.0576$, Donkey $p = 0.620$, Camel $p = 0.667$ and Wheelbarrow $p = 0.578$. The results implies that the respondents irrespective of the nature of the road rarely used these types of IMT. However, the null hypothesis was rejected and therefore a conclusion was made that there is a significant relationship between the type of IMT used and the road access.

The research also found out that, IMT promote the movement of people and their goods within the study area, through accessing the poor rural road. The relationship that exists between the agricultural produce found in the study area and the people that patronized the market should be seen as a functional relationship and this existed only through the use of IMT as the means of transport in the study area. IMT contribute to the livelihood of the people within the study area as; collection of water, grinding mills and collection of firewood, majority use wheelbarrow followed by animal drawn cart and bicycle. Donkey is also used for grinding mills but by very few respondents.

Motorcycle is majorly use to health care center, followed by bicycle, animal drawn cart are also used as a means of transport to health care center but usually it is used in transporting pregnant women on labour. Furthermore, motorcycle is majorly used to places of worship, followed by bicycle. Horse, Camel and Donkey are used as a means of transport to places of worship but at a very low percentage.

Recommendations

The following recommendations were suggested in order to solve or improve the use of IMT in the study area. Two behaviours were identified as being particularly essential to operator's safety. The first behaviour was the necessity of being able to handle the IMT proficiently and skillfully. The second behaviour was related to the need for IMT operators to maintain a high level of concentration when riding and to be aware of the changing road environment especially during raining seasons. Moreover, the IMT users through their union (if they have), can serves as their guarantor to obtain loan from any financial institution such as Micro Finance Bank to purchase a vehicle (IMT) and pay instalmentally.

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