

MOTORCYCLE TAXI IN ADDRESSING THE RURAL TRANSPORT CONUNDRUM

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Keywords: motorcycle taxi, rural transport conundrum, Kenya

Abstract: Rural people need transport services to access basic services and livelihoods. This study analyses the extent to which the motorcycle taxi addresses rural transport problems. Such an analysis could inform the future of rural transport interventions. Rongo, a rural sub-county in Kenya, was chosen for the study. The analysis results using data from 289 household heads show that predominant activities in the study area transformed motorcycle taxi activities throughout the day. Motorcycle taxis offered useful rural transport services and complemented many public transport systems in facilitating access to places, markets, facilities, and activities. Respondents associated the physical characteristics of the motorcycle taxi with motivations for its use along with its actual use. Although most of the respondents expressed satisfaction with the motorcycle taxi sector, there was a clear difference between groups. Respondents' satisfaction with motorcycle taxi services was mainly due to the motorcycle taxi physical attributes. The respondents mainly related negative reasons to motorcycle taxi riders' mannerism, unprofessional driving, and poor safety. This paper concludes that the motorcycle taxi facilitates the movement and operations in rural villages. Using motorcycle taxis have shown to have a close link to rural areas and rural life. This study calls on transport practitioners to rethink the concept and image of sustainable rural mobility and identify with rural informal motorcycle taxi transport as well. For equitable, accessible and sustainable rural transport, the transport practitioners need to empower and expand on existing realities in rural areas.

1 Introduction

Rural people need transport services to access basic services and livelihoods. However, poor maintenance and provision of road infrastructure plus poor availability of transport services, unreliability, high fares, and security issues are widespread restrictions on rural travel. There are particular ownership restrictions on motor vehicles and intermediate means of transportation to rural elites. Certain vulnerable groups—the young, the old, infirm, and women—face particular mobility difficulties; with women and girls, this may include cultural constraints on their movement [1].

In many rural and urban parts of sub-Saharan Africa, motorcycle taxis (MTs) have become the most used means of motorised transport [2]. This could have been due to increased transport demand and inadequate conventional rural transport services [3] such as (four-wheel) taxis or buses. In these rural areas, MTs complement existing public transport services by transporting people between villages and the road network where long-distance transport services are available. They play a vital role in linking people to services, farms, and markets. Nowadays, rural people use MTs to make journeys that they previously made on foot.

The MTs operate on a relatively short distance (usually less than 10-20 km) from 'stands' in towns and business centres and stops along the major roads for passenger service providing access to feeder routes [4]. The MTs begin in urban areas [5], where there is a high demand for point-to-point transport services, it stretches out to the peri-urban areas and then to broader villages before entering remote rural areas [6]. Men appear to dominate activities related to MT transport [7].

The fares charged by the MT riders vary depending on distance, time, locations, weather, day, or even location of approaching a MT rider for example on the road or at a stage. However, the user can either bargain or search for another rider at a more reasonable price [8]. The fares go up during rainy [9] and may decrease by approximately 60% if the MT carries two passengers [5]. Although rural MT users often complain that the fares per kilometre for rural MTs are typically more costly and say they prefer to use conventional (four-wheel) taxis or buses, when these are available [10], it is the lack of timeliness (or absence) of such alternatives that provide the 'market' for MTs [5,11].

MTs provides even the most remote rural communities with a means to access essential services and livelihoods. According to [11], MTs offer benefits such as flexible

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access to the major routes plied by lower-cost public transport services such as conventional (four-wheel) taxis. It also provides door-to-door travel, which is of particular use to older or disabled passengers. They offer timely transport of people and goods, with no waiting time, and take people straight to their required destinations. Rural inhabitants appreciate this [10]. The efficiency advantages that rural people get when they can access MTs by mobile phones are impressive [1,5]. As noted by [12], several riders use mobile phones so that customers can call them.

Even though people use MTs for public transport in both urban and rural areas, their operations in urban areas are reportedly becoming a nuisance due to recklessness, lack of lane discipline, unsafe manoeuvres and high incidence of crashes [13,14]. The same cannot be said of rural areas because of the low volumes of traffic, absence of congestion on the networks, lack of alternative modes of public transport among others. According to [15], the main driving force of MT growth is socio-economic considerations including the low initial purchase costs, low operating cost that are typically linked to the superior fuel economy or reliability of MTs relative to cars, their relatively low maintenance costs, and perhaps the main employment opportunities for unemployed youth in Kenya.

In most countries, the law allows for one driver and one passenger only [11]. However, one can see four to five riders on a single MT, seriously overloading acceptable limits on motorcycles for travellers [16]. The result is that where there are many MTs in use, there are often increasing numbers of disadvantages, to which the authorities have to respond [8]. Government efforts to regulate the MT market in Kenya have had the problem by distorting market structures. This is probably because policies planned to regulate the market have failed to consider the peculiar rural contexts and concerns. The government either lack awareness or may be ignorant of the rural transport situation.

The sheer numbers and scale of uptake in rural Kenya probably show that many people believe the benefits offered by MTs outweigh the risks [7]. Existing studies on MT transport focus on sub-Saharan and Asian cities, but rarely in rural areas. They concentrated on the problems, regulatory approaches, and barriers for change while focusing only on MT riders—demographics, ownership, and associations. Overall, there is a knowledge gap on the extent of MT transport services in rural Kenya. Besides, familiarity with the trip purpose, passenger profile and needs, travel patterns and user preference in rural areas is also lacking. This paper analyses the extent to which the MT addresses rural transport problems, taking Rongo sub-County in Kenya as a typical case.

2 Methodology

This is a cross-sectional descriptive survey that used a mixed-method approach that used different methods, including a survey, observation, and analysis of secondary

data, for collection and analysis of qualitative and quantitative data. The study was conducted in Rongo sub-County, in Migori County, Kenya, in the months of November and December 2019. The study purposively selected Rongo sub-County as the study site because the sub-County is a typical case of a peri-urban Kenyan setting. The main respondents comprised all the heads of household in the Sub-County, from whom the study drew a sample size of 395 household heads. The study determined the sample size using Taro Yamane's formula [17]. The formula states (1):

$$n = N/[1+N(e)^2] \quad (1)$$

where n is the required sample size, N is the size of the target population and given as 29,087 household heads [18], and e is the error term (.05). Respondents were selected through the two-stage cluster sampling technique, in which the study area was first divided into the seven locations that comprise Rongo sub-County. Two locations were purposively selected - Central Kamagambo which is predominantly urban and West Kamagambo which is predominantly rural. A sampling frame was drawn for each of the selected locations, from which respondents were picked using the systematic random sampling method. The study complemented data from main respondents by information gathered from key informants, who included six village elders, four ward administrators, and two chiefs. It purposively selected all key informants from the study area. Further, the study used convenient sampling to select 16 focus group discussion (FGD) participants based on their accessibility and readiness to take part.

Research assistants administered a semi-structured questionnaire to the main respondents. The questionnaire obtained information about the MT travel patterns, MT trip distance, frequency of MT use, reasons for MT use and respondents' satisfaction with MTs. To complement the questionnaire, the study conducted two FGDs, one in each of the selected locations. Each FGDs had eight participants of the same sex and age group and discussed the MT travel patterns, MT trip distance, frequency of MT use, reasons for MT use and satisfaction with MTs. The principal investigators conducted all the key informant interviews to collect data about travel patterns of MT users; average MT trip distance; frequency of MT use; MT trip purposes; reasons for MT use; riding styles of MT users; and MT users' satisfaction. The study also observed MT trip density at different times of the day and riding styles of MT users at the main termini and along the major roads in the sub-County.

This study sought informed consent from the respondents. It also assured the respondents of their anonymity and confidentiality of all information obtained. Quantitative data collected were analysed descriptively using IBM SPSS V.25 software and findings presented in frequency tables and bar charts. Qualitative data were analysed thematically.

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3 Result and discussion

This study achieved a response rate of 73.2%. It distributed 395 questionnaires out of which the respondents duly filled and returned 289. Based on [18], the study deemed the response rate as adequate for the generalisation of the study findings to the target population. The study attributed part of the non-response to the non-availability of respondents who were busy

working during the day and were reluctant to take part in the study because it could interfere with their earnings. The respondents composed of 96% and 4%, household heads and spouses respectively, primarily indicating the reliability of the responses as the study assumed them to have accurate facts about the status of household travel activities. Table 1 presents the socio-demographic characteristics of the respondents.

Table 1 Socio-demographic characteristics of household heads

		Total N=289	
Socio-demographic Characteristic		Frequency (n)	Percentage (%)
Gender	Male	230	79.6
	Female	59	20.4
Age group	Below 20 years	12	4.2
	21-30 years	61	21.1
	31-40 years	94	32.5
	41-50 years	59	20.4
	51-70 years	45	15.6
	Above 70 years	18	6.2
Level of Educational Attainment	No formal schooling	5	1.7
	Primary	72	24.9
	Secondary	126	43.6
	Post-secondary	86	29.8
Marital Status	Single	13	4.5
	Married	206	71.3
	Divorced/ Separated	31	10.7
	Widow/ Widower	39	13.5
Main occupation of Household Head	Student	24	8.3
	Petty trading	63	21.8
	Farmer	154	53.3
	Civil servant	17	5.9
	Employed in private sector	31	10.7
Average Family Monthly Income in Kenya Shillings (Kshs).	Less than 10,000	108	37.4
	10,001- 25,000	84	29.1
	25,001-35,000	58	20.1
	Over 35,000	39	13.5

Note: Kshs. 106.50 (Kenya) = \$1.00 (Dollar)

As shown in Table 1, over two-thirds (79.6%) of households in the study area male-headed, as is typical of rural areas in Kenya [19]. This finding has a direct bearing on transport choices, considering that more than half of passengers are usually male [12]. The finding also indicates the patriarchal nature of the study area, which could have a bearing on transport use patterns. The study also found that slightly more than half (52.9%) of all household heads are aged between 31-50 years, as stated in Table 1. Of greater interest, however, is the revelation that one-tenth of the household heads were below the age of 20 (4.2%) or above the age of 70 years (6.2%), in conformity with the population structure in developing countries.

Data in Table 1 shows that the level of literacy in the study area is relatively high, with approximately two-thirds of the respondents (63.4%) having attained at least secondary school education out of which 29.8% of them have attained post-secondary education. Only about 1.7%

of the respondents did not have any formal schooling. This can result from the free primary education programme in Kenya which was reintroduced by the National Rainbow Coalition (NARC) government that was elected into office in December 2002 [20]. The findings of the study are so synonymous to the rural area because secondary education level is the limit of free education opportunity in Kenya where education is still affordable by the average poor. In most cases, those who meet requirements for higher education give up at this stage due to the cost involved. Such people settle for other means of livelihood thus underlining the potential of MT transport in the provision of employment to various categories of people in rural Kenya.

Over two-thirds (71.3%) of the respondents were married, and only 4.5% were single and had never been married, as shown in Table 1. The marital orientation of an individual, to a great deal, is a determinant of engagement

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in certain occupations, and more often, adult responsibilities can always compel people to travel take up any engagement provided gains are promised. Married people may have to travel on a daily or regular basis for employment. Through MT transport, family ties are established, reaffirmed, and consolidated [21]. According to [22], the average household size in Rongo sub-County was at 4.3 members. In the present study, the average household size is 4.1 which is close to 4.3 hence consistent.

The study also revealed that slightly more than half (53.3%) of the respondents were engaged in peasant farming and approximately fifth (21.8%) were engaged in petty trading, as stated in Table 1. Of important note, only 16% of the respondents were in formal employment. This suggests that the majority of the population in Rongo sub-county are small-scale farmers who need to access markets for sale produce and purchase of inputs. They want transportation services that allow them to travel with baskets or sacks from and to those markets. The results are in line with [23], that the main socio-economic activity of Rongo sub-County is agriculture. Rural Kenya is mostly characterised as an agrarian region as most of its inhabitants remain heavily dependent on agriculture as the key employment source.

The above findings could explain the fact that on average, the majority of the respondents (66.5%) earn less than Kenya Shillings 25,000 per month, as stated in Table 1. This implies that unemployment is high relative to levels of income. According to [15], socio-economic considerations are the primary driving force behind the growth of MTs. Among the study respondents, MTs can be

profitable to own and profitable to lease because of low-cost capital and low operating costs that usually have to do with superior fuel efficiency or vehicle performance. Perhaps the most important in Kenya’s rural context is the employment opportunities it offers to our unemployed youths.

3.1 Motorcycle Taxis in Addressing Rural Public Transport Problem

This study analyses the extent to which the MT addresses rural transport problems by looking at travel patterns of MT users; average distance covered during the MT trips; frequency of MT use; reasons for MT use; the MT safety concerns, and MT user’s satisfaction in the study area. The findings are discussed below.

3.1.1 The Travel Patterns of Motorcycle Taxi Users

The study observed the density of MT trips based on time of the day within Rongo sub-County to identify the users, common trip origin, destination, and time of the day of MT trips. The most exciting aspect was that motorbike taxi trips seem to be scattered from various areas while destination points are more focused on Rongo town. Whereas the town is the focus of most MT trips, time changes based on MT trip origins and destinations in Rongo sub-County could better inform the purpose and pattern of the trip. Therefore, Table 2 shows the percentage of trips that the respondents took at different times depending on their origin and destination points throughout the day.

Table 2 Points of origin (O) and destination (D) of motorcycle taxi trips

Category	Point of Interest	Percentage of points of origin (O) and points of destination (D) based on time of day									
		05:01-10:00		10:01-13:00		13:01-16:00		16:01-20:00		20:01-05:00	
		O	D	O	D	O	D	O	D	O	D
Formal commercial and business areas	Regional centre	7	9	13	15	15	15	17	11	14	9
	Main markets	9	12	14	15	15	15	17	12	12	7
	Public institutions	8	9	12	11	14	14	11	10	8	6
	Places of leisure	4	2	4	2	2	2	5	3	20	18
Hospitals and health facilities		4	4	4	5	4	11	5	9	3	3
Education centres	Universities	3	11	7	11	12	9	8	7	4	4
	Schools	0	16	0	3	2	1	12	0	0	0
Small-scale and informal business areas		9	9	9	10	10	12	11	10	11	12
Agricultural areas		5	5	5	4	4	2	3	2	3	1
Centres of worship		3	3	3	4	2	2	4	3	1	3
Residential places of respondents based on their income levels in Kshs.	Below 10,000	16	6	14	6	7	7	5	14	8	11
	10,001-25,000	14	5	9	4	4	5	4	10	6	10
	25,001-35,000	12	4	4	4	3	4	2	9	4	8
	35,001 and above	6	3	3	2	3	4	1	5	3	7
Total		100	100	100	100	100	100	100	100	100	100

Note: Kshs. 106.50 (Kenya) = \$1.00 (Dollar)

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Table 2 reveals two contradictory phenomena. First is the revelation that MT trips to commercial areas peak from mid-morning to mid-afternoon. The heavy flow of MT traffic at these hours indicates that Rongo town is essentially a daytime economy. Interestingly, these peak hours also apply to health facilities. Even more interesting, is the revelation that although FGDs pointed to the use MTs to commute to work, Table 2 does not show a marked intensity in traffic during early morning and late evenings, which are the typical times for reporting to, and leaving work. The second phenomenon that can be gleaned from Table 2 is the fact that even though the intensity of MT traffic reduces from late afternoon, it does not die off completely. This shows that while Rongo is mainly a daytime economy, activities continue, albeit at a slower pace, even through the night. During such times, MT is the only mode of transport for people without private cars. Remarkably, from 20:00 to 04:59 between evening and dawn, MT trips in places of leisure escalated. Other purposes reported during this period travelling to places of worship, when it is risky to walk at night. Also, respondents resonated that those who arrive late in the night from cities using public buses usually use MTs to travel to residential areas.

Table 2 also shows that the points of origin and destination in the morning and after working hours, were mostly residential areas, particularly among the respondents with low levels of income. This reflects MTs' dependence among respondents with low levels of income. The activities of MT in medical and educational centres were fairly consistent, with increased demand at a specific time interval. Rongo University, for example, was the most common destination, especially if lectures were before noon. Besides, there were high MT activity after-school hours between 13:01 and 18:00 and between 10:00 and 16:00 which is normally the lecture periods for Rongo

University and visiting hours for hospitals. Variation of MT trips destination and origin with time highlights the purposes and drivers of the MT trips. The early period, 05:01 to 10:00, showed a high number of trips, showed many trips, especially from residential areas. This explains that the trips entering these major roads were from distant parts of Rongo Sub-County and even surrounding areas outside the sub-County to go to school or work. This was true in areas of small business centres such as Kanyawanga, Kangeso, and Opapo.

There were many MT trips concentrated within the economically active area of Rongo town between 10:01 and 13:00 working hours. This was heightened between 13:01 and 16:00 especially within the socially and economically active places. Table 2 further shows a clear shift in the activities from the town to smaller centres in the late afternoon, a sign that commuters were returning home. This shows that the day population of Rongo town is higher than its night population and that many people live away from the town. The findings are in line with related studies showing that MT trip purposes vary from one user to the other. For example, [21] argues that the rural population mainly uses the MT service to maintain or create social interactions. According to [5], produce markets, shops, government and private services, clinics or hospitals and high schools are the key destination for rural MT services. Major activities in Rongo sub-County, especially commercial activities, change with the predominant MT trips over various periods. The change of trip patterns corresponds with the rural people's daily life and activities to reach different markets, places, and activities.

3.1.2 Average Motorcycle Taxi Trip Distance

The MT trip distance was established by looking at frequency distribution for all the MT trip's distance in kilometres. The findings are as presented in Figure 1.

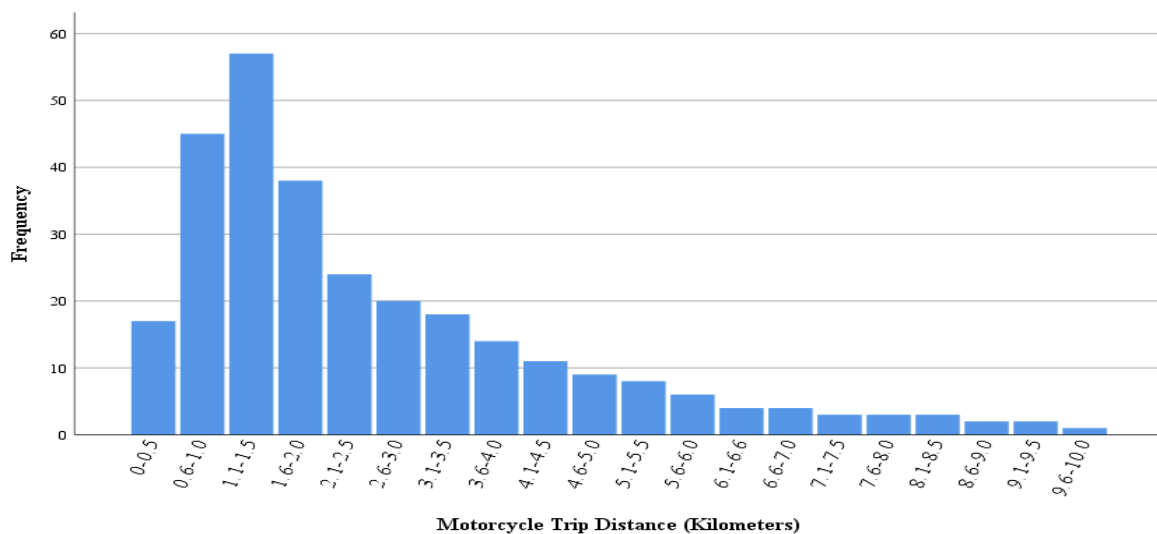


Figure 1 Motorcycle taxi trip distance

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Figure 1 illustrates that most of the MT trips were between 600 meters (m) and 2 kilometres (km), while long-distance trips of over 6 km were lesser. The results of the study showed that most MT trips were short, with an average distance of 2.98 km for all trips. Amongst the respondents who knew the time they took on a MT trip indicated that the time taken ranged between 3 minutes and 30 minutes. These findings reveal that people in the study area mostly used MTs for travel between shorter distances. Most respondents expressed a preference for conventional (four-wheel) public buses or taxis for long-distance travel.

The study finding on MT trip distance is consistent with the results of [12], who found that MTs provide a low-capacity, short-distance services to serve low-density

demands. They are complementary to conventional (four-wheel) taxis or public busses by transporting people between villages and the roads where longer-distance transport services operate [5,6]. Starkey [6] also argues that MTs operate on fairly short distances (often less than 10-20 km). This study attributed the short distance MT trips to the physical location between locations and the flexibility of MT, which could opt for alternative shorter routes for faster access.

3.1.3 Frequency of Motorcycle Taxi Use

The study asked respondents about how frequently they used MTs. The findings are as stated in Figure 2.

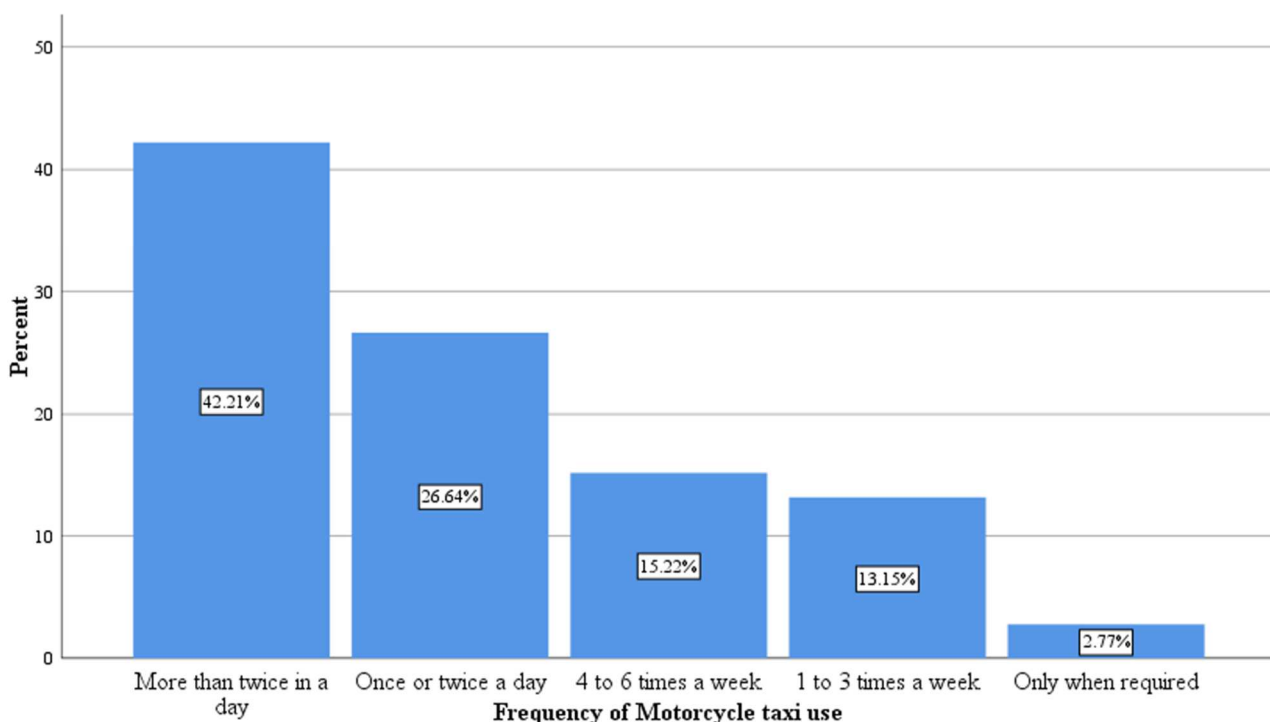


Figure 2 Frequency of motorcycle taxi use

As stated in Figure 2, more than half (68.9%) of respondents used MT transport every day. Out of this (42.2%) are even more frequent users because they use MT transport more than twice in a day. Only about 2.8% of respondents use it only when it is necessary or in an emergency. These study findings imply that most respondents very depend on a MT for mobility within and even outside of Rongo sub-County. A key informant informed the study:

“In Rongo sub-County, so many people rely on motorcycle taxis for transport. Without them, many people won’t be able to get around quickly at all.” (Ward administrator 2, Rongo sub-County, December 2019).

These study findings are in line with other studies on MTs. For example, [7] shows that MTs thrive in areas where conventional motor transport services are

uneconomical or where tough terrain makes operation of other types of vehicle challenging, such as in remote rural Kenya. According to [5], MTs are increasingly acting as feeder services, linking off-road villages to other, more affordable forms of motorised transport services, moving passengers from rural areas where unmade road networks exist, to paved roads.

The study findings can be explained by the restriction on ownership of motorised vehicles and intermediate means of transportation to rural elites. Most rural people require personal transport or some form of public transportation service to carry themselves and their goods on rural roads, which are slippery and rocky at an affordable cost. MTs are adapted to these rural roads, thus becoming the preferred means of public transport by the inhabitants of Rongo sub-County. On many rural roads,

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they are the only motorised means of transport for most rural people.

3.1.4 Reasons for Motorcycle Taxi Use

The study asked respondents to explain their reasons for their choice for the use of MTs. The study ranked the responses: (1) Convenience (82.4%); (2) Cost-effective (79.2%); (3) Motorcycle taxi riders know specific destinations, are trustworthy, and relational (71.6%); and (4) Saves and keep time (57.1%). In this study, the ease with which rural people can access MTs underlines the convenience of using them. Data from observation and corroborated by qualitative data from FGDs show that finding a MT in the study area is fairly easy. The FGDs further revealed that most of the frequent users have contacts of several riders in their phones, further reinforcing the notion of convenience since the riders are available at the client's convenience. Based on user budget, time, and accessibility, the MT trips can be a direct point to point, or initial or final segments of a longer trip. A FGD participant well summarises MT transport characteristics: *"Boda-boda [motorcycle taxi] can help you reach places if you don't have a car...there are some places the motor vehicles can't reach and obviously one can always lock his/her motor vehicle, take on a boda-boda and complete the journey and come back later, enter the vehicle and continue driving. They can come and pick you. They are also quick...! So, when I need to go home early so, they are convenient and are always available.... one can always use his/her phone to call the riders."* (FGD01, Male, Age 36, December 2019).

Data from observation also revealed that MTs are available in abundance at very many points within the study area. Throughout the study area, the study observed MTs parked at shades constructed for that purpose, dotted all over the study area. MT riders could also be seen riding around the study area without passengers, scouting for clients. Qualitative data from FGDs revealed that locals perceive that MT transport is a very convenient and functional mode of transportation that offers advantages in terms of easy manoeuvrability, capacity for poor road travel, and demand responsiveness. The qualitative data revealed that the performance advantages that rural people get when they can access MTs by mobile phones are impressive. To rural people, this additional level of connectivity is a travel revolution. Even though they cannot afford to travel regularly more individuals can now access MTs in an emergency. Rural people consider this to be of crucial importance to their well-being.

Similarly, the ability of MTs to save and keep time featured as one reason for using MTs, at 57.1%. During FGD for females, it was largely agreed that the MT is *"the fastest means of transport"*, and that this was valuable, as many women were now trying to combine trading activity with family life. Another prominent reason for using MTs was their perceived cost-effectiveness. Over four-fifths of the respondents (84.4%) listed cost-effectiveness

consideration for using MTs. Although conventional (four-wheel) public buses or taxis maintains the competitive edge of cost, passengers opt MT transport for its timesaving. A FGD participant indicated:

"While going to Rongo town, a conventional matatu [four-wheel taxi] charges me a fare of Kshs.50 compared with a motorcycle taxi, which charges a minimum of Kshs. 100. It is significantly more expensive to travel on a motorcycle taxi but if you think about the time that you save, it gets cheaper. Time is money! It even becomes cheaper if you consider all other factors." (FGD05, Male, Age 41, December 2019).

The study findings also reveal that the price paid for MT trips varies and is negotiable. A key informant reported:

"The price depends on how you are dressed up or how you bargain... The riders charge you accordingly so long as you are dressed presentably. For instance, a four-kilometre could cost between Kshs. 20 and Kshs.30 but a two-kilometre trip could cost Kshs. 40. The riders charge between Kshs. 50 to Kshs.100 for trips ranging between five to seven kilometres are." (Key informant 2, Male, Village elder, Age 62).

The respondents listed another reason for choosing to use MTs as their perception that MT riders know specific destinations, are trustworthy, and relational, at 71.6%. They perceived the MT riders to know every route and every place, including shops and offices. The respondents saw the riders as friendly and trustworthy and reported to not only used MTs for commuting but also for running personal errands. Most customers were referring to specific MT riders as *'my boda-boda [MT] guy'*.

The findings of this study show that MTs fill the gap in the demand and supply of rural public transport; by providing reliable and continuous rural public transportation services to the locals. Rural people perceive the MT as a very convenient and functional mode of transportation that offers advantages in the form of easy manoeuvrability, the ability to travel on poor roads, and demand responsiveness. The findings are consistent with related studies conducted on MTs showing that passengers opt for MTs because they are timely (minimum waiting, point-to-point journeys, sometimes able to travel faster than conventional vehicles) or because there are no appropriate alternatives. As a result, rural people appreciate this and value MTs high as they are fast [24] and readily available. Rural users hire the MTs for their journey by only waiting until one came by. Although, rural users often complain about the high costs of rural MTs, and say they prefer to use conventional (four-wheel) public buses or taxis when these are available [10]. The fares go up during rainy seasons as echoed by [9]. Howe [12] also noted that some riders were already using mobile telephones so that customers could summon them.

In certain parts of Rongo sub-County, some unmaintained roads were not wide enough for conducive car driving. The MTs provide a reliable, rapid, and

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relatively inexpensive transport service that can traverse dirt roads too rugged and/or narrow for a car while going longer distances and into steeper terrain. They are the only motorised transport services that people can rely on. For example, the villages surrounding the Kangeso Sub-location do not have any other public transportation option aside from the MT transport service. The convenient, easily available, and affordable means of transport is the MT which is more affordable and marches their purchasing power. In this study, MT fares have been varying especially according to the will of the transport drivers who in a situation of monopoly dictated their prices to the population that became a hostage of the situation. The fares vary depending on distance, time, locations, weather; day, or even location of approaching a MT rider for example on the road or at a stage. However, the user could bargain or search for another rider at a more reasonable price.

3.1.5 Safety Concerns

Data from observation revealed several safety concerns. The first was the practice of carrying two or more passengers, which appeared to be the norm, rather than the exception. This was corroborated by qualitative data from FGDs, which showed that in the study area, it is normal for MTs to carry two or more passengers. A FGD participant indicated:

"Sometimes it forces us to share the only available boda-boda [MT]... there are other times when children, people with disabilities and older persons are required to travel with their supporting persons (parents/helpers)." (Respondent 21, Male, Age 71).

Another FGD participant indicated that:

"I feel more secure when we are two or three people on one MT, especially at night. The riders, however, do not reduce the fares paid when they carry more than one passenger. They charge us per person." (Respondent 127, Female, Age 26).

Data from FGDs further revealed that in certain circumstances, rural people even considered it necessary for MTs to carry two or more passengers. One such circumstance arises when only one MT is available and there are two or more passengers. Another circumstance occurs when an adult need to travel with an infirm person such as a child, a sick person, or an elderly person who requires support or prop up on the MT. Some female passengers feel more secure when they outnumber the rider, especially at night. These findings explain why in many African, Asian, and Latin America countries, enforcement officials often hesitate to apply the 'one passenger' limit in rural areas. Contrary to [5] that fares may decrease by approximately 60% if a MT carries two passengers, qualitative data revealed that even though the price is negotiable, the cost rarely reduces significantly when there is more than one passenger.

Another observation regarding safety was that passengers rarely used safety helmets. FGDs revealed that many female pillions refused to use helmets, citing that it could interfere with their hairstyle. This was making them more vulnerable to head injury in the event of an accident. This study however observed that the residents including well-dressed ladies were sitting astride on the MT. This reduced the risk of the passenger being dislodged from the MT. In pillion accidents, passengers suffer a serious injury to their bodies. Key informant interviews also showed that many passengers refused to use reflectors as required by law. They argued that the reflectors were dirty and susceptible to skin disease transmission. This threatened the lives of both the rider and the passengers on board as they were not visible from afar, especially in the obscurity.

The study also found that drunk male pillion passengers posed a lot of challenges to the riders. The study could attribute this to the fact that some drunk pillion passengers even fall asleep while they are on the MT, and as such, they fall off the bike. This forced the riders to look for another rider to sit behind a drunk passenger. During the FGD for the male, it was reported that some intoxicated passengers turned out to be annoying, especially when they said they had paid while they had not. In some situations, they asked riders to fight so they could avoid paying for travel. Besides, the study observed that MT transported regular items such as foodstuffs, boxes, water to more unusual items such as furniture, construction materials (such as cement, roofing sheets, and steel reinforcements rods), farming tools, coffins, and human corpses. Sometimes the goods carried were more massive than the capacity of MTs hence causing accidents.

These findings are in line with related studies on MT safety. For example, [6] notes that in some countries, four or five people can be seen on a single MT, dangerously overloading the recommended limits on motorcycles for passengers. This is despite the law in most countries that only allows for one driver and one passenger [11]. The study findings are consistent with [25] who noted that in the Rural Community of Tombel, South-West Region Cameroon, the MTs transport of goods to and from the markets and farms in quantities heavier than their capacity. People also used these MTs in transporting uncommon items such as coffins and human corpses [25,26].

3.1.6 Motorcycle Taxi Users' Satisfaction

In assessing whether MTs are a problem or as a solution to rural public transport issues in Rongo sub-County, the users' satisfaction and perceptions are valuable especially because they are the main MTs customers. The users' satisfaction and perceptions could identify the MT's characteristics, performance, and potential for addressing rural public transport problems. The study required the respondents to rate their satisfaction with the MT transport service. Table 4 presents the findings.

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Table 4: Motorcycle taxi users' satisfaction

Strongly Dissatisfied	Dissatisfied	Neutral	Satisfied	Very Satisfied	Total	Min.	Max.	Mean	Std. Dev.
24	33	56	143	33	289	1	5	3.44	1.098
8.3%	11.4%	19.4%	49.5%	11.4%	(100%)				

As stated in Table 4, the level of satisfaction with MT is slightly above average, with a mean of 3.44 on a scale of 0-5. Approximately two-thirds of the respondents (60.9%) were satisfied or very satisfied with MT. Only one-fifth of the respondents (19.7%) were strongly or otherwise dissatisfied with MT. This is a very interesting finding when seen together with qualitative data from FGDs. Whereas only one-fifth of the respondents expressed dissatisfaction with MT, qualitative data revealed that an overwhelming majority of the respondents perceive MTs as being recklessly ridden, by riders of questionable character. There was a consensus in all the FGDs, that MTs are an unsafe mode of transport, with a very high likelihood of involvement in accidents. The study attributed the perception that MT is affordable, convenient, and

timesaving to the apparent contradiction. Rural people believe that MT riders are very well versed with different alternative routes and know most places, reducing the likelihood of getting lost, or wasting time asking for directions.

There was a variation in the responses by the respondents with standard deviation reaching 1 which is a testimony to the heterogeneity of the responses. This study compared the levels of satisfaction against respondents' gender and level of income to establish any underlying differences or influences. Figure 3 presents a comparison of the levels of satisfaction with gender while Figure 4 compares the satisfaction levels based on different levels of income.

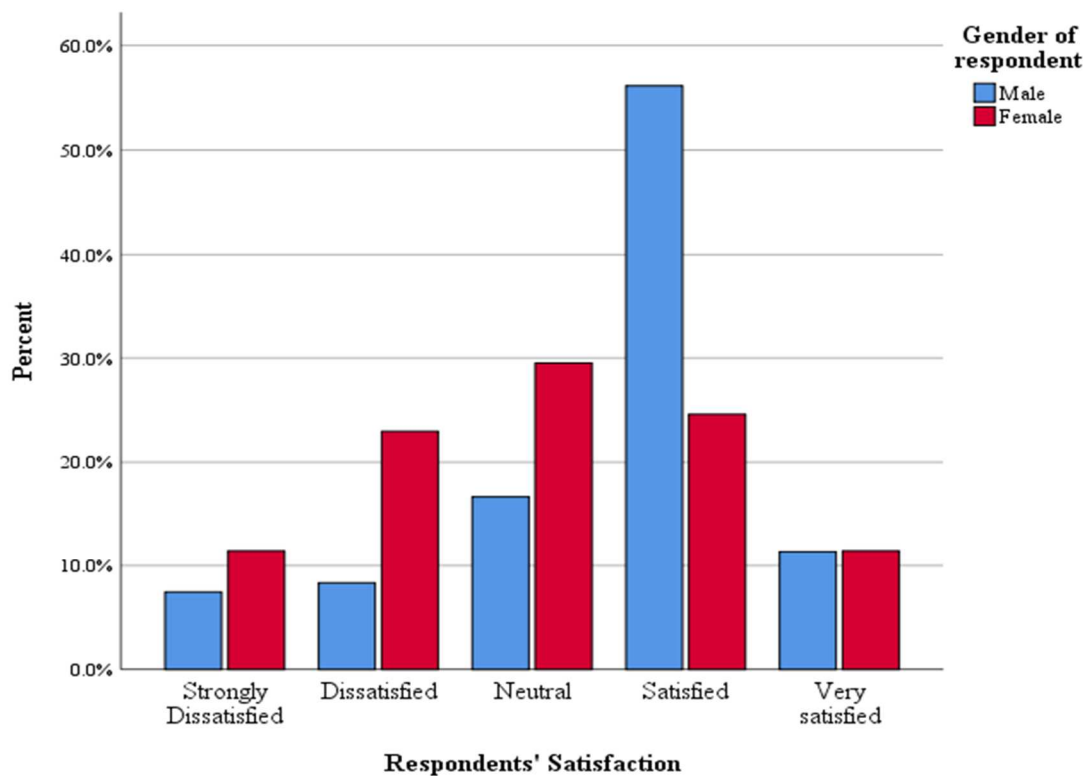


Figure 3 Respondents' level of satisfaction with MT, segregated by gender

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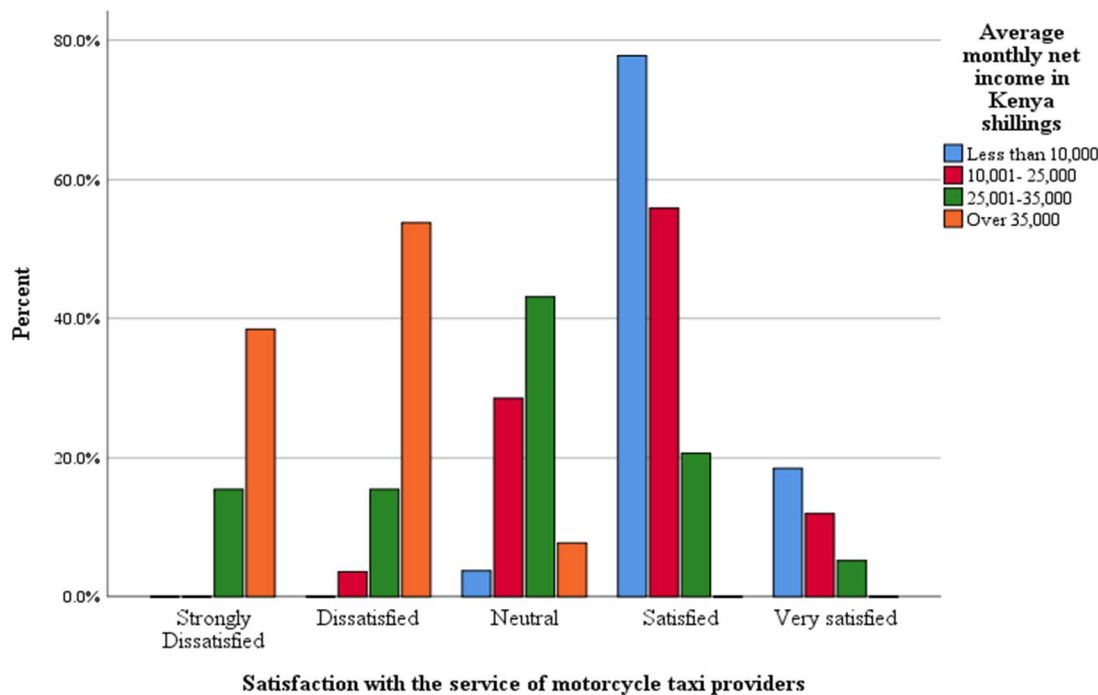


Figure 4 Motorcycle taxi services satisfaction level based on levels of income

Figure 3 reveals that male respondents were somewhat more satisfied with motorcycle taxi services than their female counterparts. Three gender themes emerged from FGDs. First, female respondents were more concerned about safety compared to their male counterparts. Second, female respondents appeared to be more taken aback by MT riders' perceived inappropriate behaviour than their male counterparts. Male respondents did not appear to find issues with the riders' behaviour, with some respondents even finding words of praise for the riders' apparent bravado. Third, male respondents consider MT to be affordable, as opposed to females, who find it expensive. This finding corresponds with the data in Table 5. Besides, Figure 4 shows that respondents with lower levels of income were more satisfied with motorcycle taxi services than respondents with high levels of income.

The findings are consistent with other studies on MT transport. For example, by 2001, on the Jos Plateau in Nigeria, more men than women patronised MTs. Despite safety issues associated with MTs, young women still saw MTs as a lifeline [27]. Zure and Yiboe (2017) [28] noted that although the MT business posed a lot of risks to the youth riders, most of them were unwilling to stop the business because of the socio-economic benefits they obtained through it.

This study attributed the neutral stance by to the women's concern about MT safety risks while preferring them for their speed and convenience. It attributed the

higher satisfaction level among the respondents with low levels of income to the lifestyle changes and improved income derived from MT transport. The lifestyle changes and improved income derived from MT include the low initial purchase cost, the low operating cost which relates to the superior fuel economy or efficiency of MTs in relation to cars, their relatively low maintenance cost and perhaps the most important in Kenya's context, is the employment opportunities it offers to our unemployed youths.

MTs dissatisfied respondents with high levels of income. This was largely attributed to the drivers' behaviour, and safety risks associated with MT transport. Thus, most respondents were satisfied with the MT services, largely because of the physical attributes of the MT, while negative reasons were mainly related to MT riders' mannerism, unprofessional driving, and poor safety.

Two household heads with comparable demographic backgrounds responded contrastingly about the affordability of MT transport. The first said: "I do not use a motorcycle taxi because it is too expensive that I cannot afford" (Respondent 127, Male, Age 35). In contrast, another respondent reported: "Their prices are reasonable because... I mean, from physical observation, the poor man will travel using a MT" (Respondent 21, Male, Age 35). Table 5 presents the affordability of motorcycle taxis based on gender and average family monthly income.

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Table 5 Affordability of motorcycle taxi transport based on respondents' gender and levels of income

		Expensive		Affordable		Total	
Gender	Male	46	(15.9%)	184	(63.7%)	230	(79.6%)
	Female	44	(15.2%)	15	(5.2%)	59	(20.4%)
	Total	90	(31.1%)	199	(68.9%)	289	(100.0%)
Average family monthly income in Kshs.	Below 10,000	9	(3.1%)	99	(34.3%)	108	(37.4%)
	10,001-25,000	55	(19.0%)	29	(10.0%)	84	(29.1%)
	25,001-35,000	4	(1.4%)	54	(18.7%)	58	(20.1%)
	35,001 and above	22	(7.6%)	17	(5.9%)	39	(13.5%)
	Total	90	(31.1%)	199	(68.9%)	289	(100.0%)

Note: Kshs. 106.50 (Kenya) = \$1.00 (Dollar)

Rural women have the largest financial restrictions for the use of transportation [28], and one would expect transport affordability to be a gender issue. This is supported by data in Table 5 which reveals that most of the male respondents consider MT to be affordable, compared to the majority of female respondents who regarded MT as expensive. Besides, this study reveals that the affordability of MT services was largely regarded as being very positive among the respondents with low levels of income, while some respondents with high levels of income considered MT as expensive. Majority of respondents with middle levels of income considered them affordable. The respondents' income levels probably did not influence their perceptions of the affordability of motorcycle taxi transport.

According to [12], those engaged in formal or informal sector wage employment seem likely to have enjoyed the enhancement of their income-earning activities through the greater mobility afforded by MT usage. Therefore, this study expected the levels of income to influence the MT users' perception of its affordability. However, the study findings have dispelled one of the commonly held illusions that levels of income influence perceptions on MT affordability. In this study, opinions on affordability hinge closer to the respondent's appreciation on lifestyle changes and the improved income derived from MTs, rather than on the levels of income.

4 Conclusion

The results show the active relationship between Rongo sub-County and MT transport services. The informal MT transport system seems to provide a partial solution to rural access. MTs offer useful transport services to rural communities difficult to reach by conventional (four-wheel) taxis or busses, due to the poor road condition and low demand. MT transport can complement many public transport systems. Removing MT from any part of the sub-county could impede the movement and operation of rural villages as its use is so closely linked to rural life.

This paper calls on transport practitioners to rethink the concept and image of sustainable rural mobility and identify with rural informal motorcycle taxi transport as well. Ultimately, the goal of mobility is to ensure that the informal MT transport system facilitates access to places,

markets, facilities, and activities. For equitable, accessible and sustainable rural transport, the transport practitioners need to empower and expand on existing realities in rural areas. They should seek to understand rural transport needs and options from rural people of different ages, gender, occupation, and income.

This study bases itself on perception data; hence bias responses may affect results. Besides, the study does not cover how MTs contribute to social development in rural areas and perceptions of rural people on the social risks and adverse consequences of MTs in rural Kenya. These are scope for the future course of the research.

Acknowledgement

The authors are thankful for the helpful comments and suggestions provided by respected reviewers. Their insightful feedback and recommendations have strengthened the scope and significance of our study. The authors are also grateful to the villagers and communities in Central Kamagambo and West Kamagambo locations for their willingness to take part in the study and providing the requested information.

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Review process

Single-blind peer review process.