



AfCAP
Africa Community Access Partnership



Rural Transport Survey Report

Kabala-Bafodia, Koinadugu District, Sierra Leone



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Cover Photo: Passenger embarking a motorcycle taxi to travel from Kabala to Bafodia. This picture and all other pictures in the report by Krijn Peters©

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Abstract

This study was carried out in the interior plateau zone in Sierra Leone, focusing on the Kabala-Bafodia rural road in Koinadugu District in the Northern Province. The study sought to understand the existing transport services for the rural communities along and within the road's catchment area. The rapid rural appraisal methodology was used to gain a deep understanding of this, via in-depth qualitative interviews with transport users, operators, regulators and local experts concerned with socio-economic development. This produced some valuable 'order of magnitude' estimates, related to movements of people and goods in the rural communities for distances greater than 5 km. Kabala, the district capital, serves as a transport, services and market hub – although without a distinctive market day – for the inhabitants along the surveyed road. Bafodia, despite being a chiefdom headquarters town, has no significant market or market day. The study showed that motorcycle taxis are the dominant mode of transport providing daily rural transport services. Hardly any car taxis ply the road, but there are a few pickup trucks which can be hired for transport needs. No mini/midi buses are present on the road, but there are trucks going up and down, involved in the construction of a road and bridge connecting Bafodia to Kamakwie. The study recommends, among other things, that at least one scheduled service should leave each morning from Bafodia for Kabala, returning in the late afternoon, to offer rural dwellers an alternative to transport by motorcycle taxi.

Key words

Rural transport services; Transport operators; Motorcycle taxi; Intermediate means of transport (IMT); Transport users; Transport regulators; Interior plateau zone

AFRICA COMMUNITY ACCESS PARTNERSHIP (AfCAP)

Safe and sustainable transport for rural communities

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Acronyms, Units and Currencies

Le	Leone (1 USD = 7500 Le)
AfCAP	Africa Community Access Project
AsCAP	Asia Community Access Project
DFID	Department for International Development
4x4	Cross country vehicle; station wagon
e.g.	For example
FrT	Freight
HIV	Human Immunodeficiency Virus
GPS	Global Positioning System
GoSL	Government of Sierra Leone
ICT	Information and Communication Technologies
IMT	Intermediate Means of Transport
kg	kilogram
km	kilometre
MCT	Motorcycle Taxi
N	Number/sample size
NMT	Non-motorised Transport
Pax	Passengers
PMU	Project Management Unit
ReCAP	Research for Community Access Partnership
RTS	Rural Transport Services
RTSi	Rural Transport Services Indicator
t	tonne
UK	United Kingdom
USA	United States of America
USD	United States Dollar
USDc	United States Dollar cent

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Executive Summary

This report presents the findings of a study carried out in the interior plateau zone on the Kabala-Bafodia road in Koinadugu, Northern Province. It is one of three rural transport survey reports prepared under the Rural Transport Diagnostic Study in Sierra Leone, with the other two reports looking at a road in the coastal plains (Pujehun District) and a road in the Interior zone (Bombali District). The surveyed road for this study is 31.3 km long and between 3 and 5 m wide, traversing a hilly terrain. The overall aim of the study is to understand the existing rural transport systems in Sierra Leone based on understanding the transport needs and preferences of rural women and men with different ages, occupations and abilities. Specifically, it aims to understand the needs and perspectives of different road users in the rural communities along and within the catchment area of the selected road, as well as transport operators, regulators and those concerned with socio-economic development. It also identified constraining factors and good practices in Sierra Leone's rural transport services, allowing for evidence-based policy suggestions.

The field data collection took place from 31 May to 4 June 2017. The rapid rural appraisal methodology was used for the study to help the researchers to understand the nature and character of rural transport systems in the Interior Plateau zone of Sierra Leone. A key feature of the rapid rural appraisal methodology is its focus on gaining a deep understanding of the issues under investigation based on a limited number of in-depth qualitative interviews involving the local stakeholders and sector experts. For this study the authors made use of four different sets of standardised questionnaires, but for each set question the interviewee was encouraged to further explain his or her answer, which was then written down as well. The data collected was derived from personal interviews by the authors of this report, assisted by three senior employees of the Sierra Leone Road Safety Authority. Road traffic counts were conducted by locally recruited literates, who were inducted and overseen by the SLRSA employees.

Results from the study

Transport users

- The motorcycle taxi (MCT) is the main mode of rural transport available to the population along the surveyed road. All transport users indicated that they use the MCT. In addition, some users indicated that they use the services of light trucks, which navigate the road because of their involvement in the construction of the Bafodia-Kamakwie road. A for-hire pickup truck is also occasionally used, particularly during the market day in Sakuta.
- There is no distinct market-day in Kabala, but the Sakuta market day does see an increase in MCTs and pickup trucks. However, some Bafodia residents do make the 7 km journey to Sakuta by foot, taking a shortcut through the hills.
- On an annual basis, the motorcycle is the main transporter of people (88%) and small freight (87%). The pickup truck is responsible for some people and freight transport, particularly where people want to travel in a large group (e.g. to play a football match in a nearby village) or when more heavy freight (e.g., building materials) needs to be transported. The use of the light truck is somewhat opportunistic given that the road construction project in which it is involved is of a temporary nature.
- The fare per passenger kilometre for the pickup truck is USDc 20 and USDc 24 for the motorcycle taxi. This makes the motorcycle not only the most expensive form of transport, but both forms of transport are very expensive as compared to other regions in Sierra Leone. This is likely due to the mountainous terrain which results in long journey times, limited loading capacity and high maintenance costs.

- Generally, transport users were moderately satisfied with the services offered by the motorcycle taxis but dissatisfied with the services offered by both the pickup truck and light truck. There is no substantial difference between the experiences of men and women regarding these modes of transport, although women seem to appreciate the freight services of the pickup truck more than the men. This is likely to relate to the role the pickup truck plays in transporting goods to the weekly market for women.
- For the motorcycle taxis, users pointed out that there were particular safety concerns related to the danger of suddenly crossing free-roaming cattle. Most users were able to recall at least one incident over the past year between a MCT and a cow.

Transport operators

- MTC operators are dissatisfied with operating a vehicle on the surveyed road.
- Pickup operators seem to be members of active associations but were dissatisfied with the security risks of operating on the road, while the MCT riders were often not a member of an active association but were in turn satisfied about the security risks.

Transport regulators

- Two regulators were interviewed. They did not comment on the compliance levels of the pickup truck but indicated that they were very dissatisfied to medium dissatisfied with both the compliance level of the light trucks and the motorcycle taxis. This fits with a more general observation by the team that the more remote and rough the road is, the older the vehicles it attracts with often low levels of compliance.

Development

- Four stakeholders concerned with socio-economic development were interviewed. They commented on the contribution to a range of development indicators by the pickup truck and the motorcycle taxi. Both modes contributed to development, according to the interviewees. It seems that between the daily MCTs and the on-hire pickup truck predominately operating during market days, most development needs are covered.

Conclusions and recommendations

- The motorcycle taxi is the most dominant and readily available mode of transport on the surveyed rural road, taking the largest share in both passenger and freight transport on an annual basis. They navigate the surveyed road (and feeding roads) each day and their numbers and number of trips further increase during the Sakuta market day. Furthermore, nearly each village has at least one or two residential MCT operators.
- There are no car taxis or mini-buses regularly serving the road. However, there are a few pickup trucks plying the road on a for-hire basis. During the Sakuta market day these make a number of runs.
- Given the steep gradients of the surveyed road, if no regular road maintenance is carried out, transport services will struggle. Once the Bafodia-Kamakwie road opens, this becomes even more important.
- Considering the importance of motorcycle taxis in providing rural transport needs, it is recommended that this is further stimulated by upgrading strategically chosen footpaths/tracks to motorcycle accessible trails. These are the Class F3 Feeder Roads, as described in Sierra Leone's National Rural Feeder Roads Policy (2011).

1 Introduction

1.1 Research Objectives

The overall aim of the rural transport diagnostic study in Sierra Leone was to understand the existing rural transport systems and the key issues relating to policies and practices in Sierra Leone based on understanding the needs and perspectives of different transport users with different occupations, ages, gender and abilities, as well as transport operators, transport regulators and those responsible for socio-economic development. Specifically, this study aimed at understanding the needs and perspectives of the different groups of stakeholders including women and men in different rural communities along a representative rural road in Koinadugu District in the Northern Province in Sierra Leone.

2 Methodology

The study was carried out from 31 May to 4 June, 2017 on the Kabala-Bafodia road in Koinadugu District, in order to understand the nature and character of rural transport systems in the Interior Plateau region in Sierra Leone. The rapid rural appraisal methodology, adapted by Starkey, et al., (2013) for rural transport services research, was used for the study. A key feature of the rapid rural appraisal methodology is its focus on gaining a deep understanding of the issues under investigation based on a limited number of in-depth qualitative interviews involving the local stakeholders and sector experts, rather than taking a large-scale quantitative survey approach. The data were collected from the rural communities along the selected study road or within its catchment area to understand movement of people and goods in the rural communities, the transport fares, tariffs, trends in transport services and preferences of road users. The rural transport services under consideration are for the medium travel distance range, between 5 km and 75 km. In this case, the studied road was about 31.3 km long. The road users interviewed included farmers, traders, students, older persons, persons with disabilities, and people using transport to access health care, maternal healthcare, formal employment, financial services and for socio-cultural reasons such as funerals, naming ceremonies and the like. For some of these categories, there were only two people interviewed (one male, one female).

Twenty-two (22) road transport users were interviewed of which 13 were males and 9 were females. The respondents included farmers, traders, older persons, persons with disabilities, students, nurses, and persons using transport to access health care, maternal healthcare, formal employment, financial services, funerals and the like. Their ages range from 18 to 75 years. Eight (8) transport operators were interviewed; seven (7) MCT operators and one pickup truck.

Similarly, in-depth interviews were carried out with a small number of transport operators for the transport modes plying the route, people familiar with regulatory issues, and those concerned with development. The people selected for the interviews had clear knowledge and an understanding of the relevant issues relating to the transport systems along the study road. Their informed opinions formed the basis for understanding the existing transport services regulatory framework, policies and practices applicable to the selected rural road and its catchment area. The data generated, though small, provide a clear picture of the existing rural transport situation. During the data gathering stage, efforts were made to ensure that data obtained were inherently consistent and represented the best possible estimates of the real situation for the study area. Information from the various sources was constantly compared by the researchers to identify and if necessary clean the data sets from discrepancies. Follow-up questions were asked to seek a clearer understanding of why for instance an answer from an interviewee was different to the answer of others, which is important for data quality assurance.

Traffic counts were carried out on a 'normal' day and on a market (busy) day, at two different locations. The traffic counting teams classified the traffic and recorded the counts during the 12-hour daytime period from 6:00 am to 6:00 pm. The classified counts involved conventional vehicles and intermediate means of transport (IMTs). One count was located just outside Kabala, approximately 1 km along the surveyed road and just after a small 'station' for MCTs frequenting the surveyed road. The other traffic count was located at the Bafodia-Sakuta junction.

Kabala has no specific market day, having market associated activities going on each day of the week. Bafodia too has no market day, but contrary to Kabala very few market activities take place here. The closest rural market to Bafodia takes place in a small village called Sakuta, about 7 km away. Sakuta is on the Bafodia-Dogoloya-Kabala gravel road, which is another way to travel from Kabala to Bafodia. While this journey is nearly twice as long as the surveyed road, it bypasses most of the hills and is relatively flat. For now, the Sakuta market attracts sellers and buyers from the rural communities in the area, but Bafodia is likely to take over this role, with plans for a permanent market structure in the pipe-line.

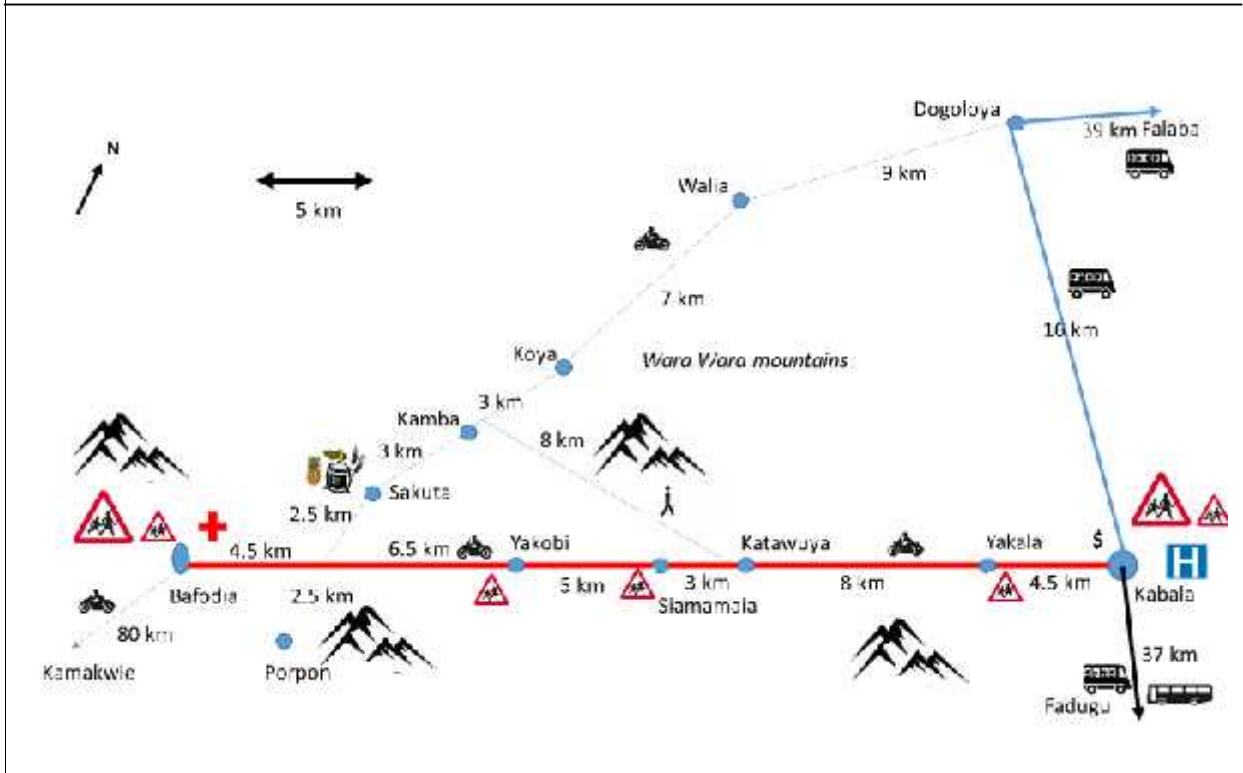
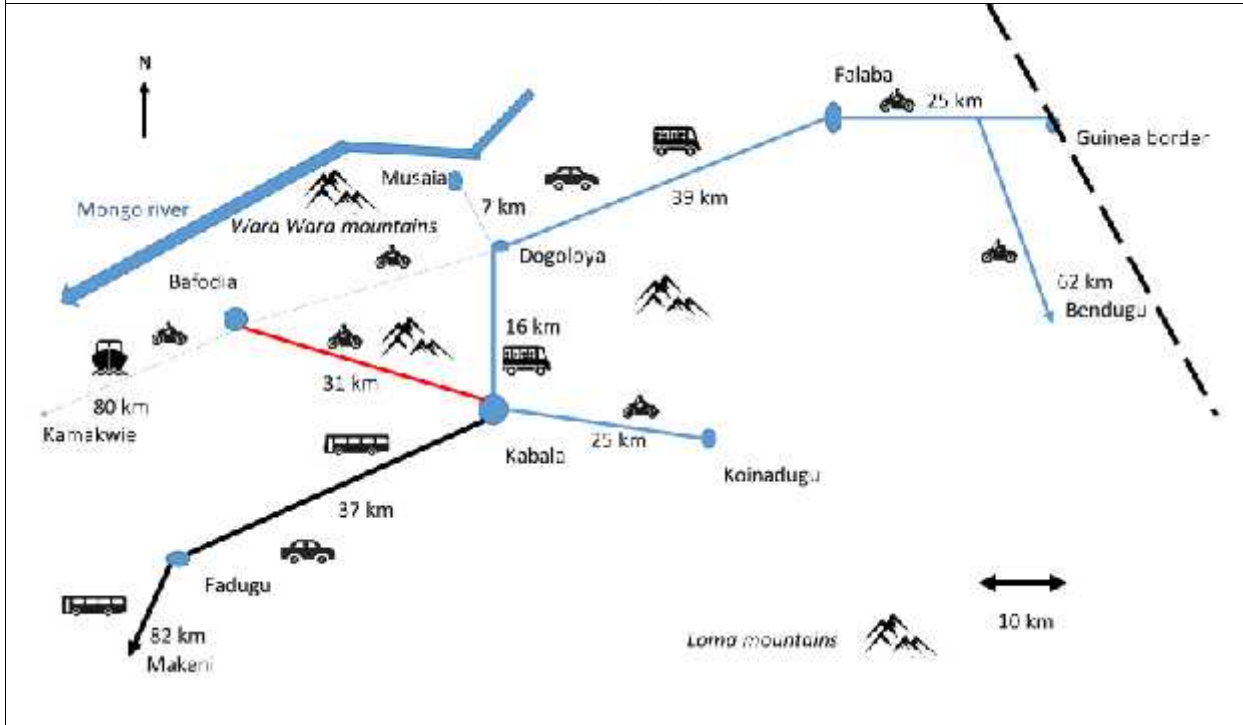
The key data in this survey report are presented in eight standardised tables. The first four tables summarise most of the key statistics and the assessments and opinions obtained from the surveys, while the last four tables summarise the opinions of the road users, the operators, the regulators and those concerned with development. Maps and photographs have also been added to the text to provide further information on the surveyed road.

3 Rural transport services: summary tables of key statistics and indicators

RTSi Road Report Table 1. Road information			
Road name: Kabala-Bafodia			
Dates of survey: 31 May 2017 – 4 June 2017			
District, Region and Country: Koinadugu, Sierra Leone			
Road type: Gravel		Responsible authority: Koinadugu District Council	
Road start location: Kabala		Start GPS coordinates: Latitude: 9°35'00" Longitude: 11°33'15"	
Road finish location: Bafodia		Finish GPS coordinates: Latitude: 9°41'00" Longitude: 11°43'59"	
Road length: 31.3 km		Catchment population 5000 to 10,000	
Road quality and condition from different perspectives			
Road authority	Operators	Development	Safety
	★★★★☆	★★★★★	
<p>The more stars (or the higher score) the better. ★☆☆☆☆ = Very dissatisfied (= 1). ★★☆☆☆ = Dissatisfied (= 2). ★★★☆☆ = Medium (=3). ★★★★☆ = Satisfied (= 4). ★★★★★ = Very satisfied (= 5).</p>			
Summary of road geography and socio-economic situation			
<p>The surveyed road runs from Kabala, the capital of Koinadugu district, to the chiefdom district capital town Bafodia. The road is a gravel road, 3 to 5 metres in width. On some sections maintenance has been conducted fairly recently, starting from 2012. Other sections still need to undergo maintenance. The road is located in a mountainous region, with significant differences in elevation. As a result some deep run-off channels in the middle of the road have emerged in the steeper sections. There are no large river crossings and only a handful of culverts. As the district capital, Kabala has a number of services available, ranging from a hospital and secondary schools to government buildings and a bank. Travelling toward Bafodia one passes a number of villages and a T-junction where one can go</p>			

left to Bafodia or right to the market village of Sakuta. Most people along the road are depending on semi-subsistence agriculture. Crops include rice, millet, maize, groundnut, and vegetables like pepper and okra. Pineapples and mango and orange trees are also common. Livestock is in the form of chickens, sheep, goats and cows, with the latter being a safety concern for travellers, because of their size and the fact that they are roaming freely along the roads.

Maps of road showing context (directly below) and road features (middle) plus map legend (far below)

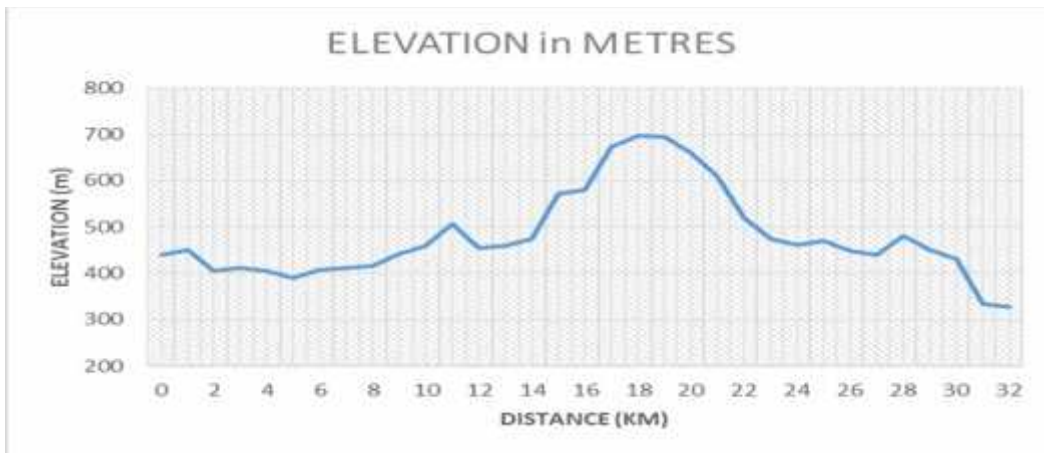




Schematic map of 'straightened' road with features



GPS elevation track



GPS speed track



Description of hub and spoke patterns				
<p>Kabala, the district capital of Koinadugu, is a significant town. Although the population density in the North is lower than in other areas of Sierra Leone, Koinadugu is the largest district of the country. The road between Kabala and Makeni, Sierra Leone’s third largest city (after Freetown and Bo) which is experiencing a post-war economic boom as a result of mining activities, is paved and in good condition. The 113 km separating the two towns can be covered in a 90 minute to two-hour drive. From Kabala the road continues to the Guinea border at Gberia Fotombu – another 65 km or so. But given the bad state of this road, this is not a major border crossing point. From the Kabala car park most car taxis and mini/midi buses leave for Makeni, with only a few leaving for the towns and villages within Koinadugu district. As is the case for the surveyed road, most of the journeys to the Koinadugu’s towns and villages from Kabala are now undertaken by motorcycle taxis. Bafodia, at the other end of the surveyed road, is not a major transport hub. It is very much at the end of the line, serving as a hub for surrounding villages. However, work is currently taking place on the Bafodia-Kamakwie road. A good connection between Kamakwie and Kabala, although unlikely to result in huge transport movements, will beyond doubt be beneficial to in particularly the smaller communities in between. Another road between Bafodia and Kabala, passing through Sakuta and Dogoloya, cuts out most of the steep ascends and descends, although it is nearly twice the length. Just beyond Kamba there is path branching off to Kabala, which has the advantage of being both relatively flat and cutting off many miles of the Bafodia-Dogoloya-Kabala road. Unfortunately, this path is – at the moment – only navigable for people on foot, although there are plans by the communities to upgrade this to a track that can be navigated by vehicles. Nearly all transport requirements on non-market days are met by motorcycle taxis, although there are a few pickup trucks on the road offering their services on a hire-basis. Bafodia has its own motorcycle taxi hub and residential MCT riders, situated in the centre of the village. Most of the villages along the surveyed road also have at least a few resident MCT riders.</p>				
Intermodal connectivity (one to five stars, the more stars the better)				
‘Feeding’ (getting to the road)	User satisfaction	☆☆☆☆	Development impact	☆☆☆☆
‘Linking’ (to onward destinations)	User satisfaction	☆☆☆☆	Development impact	☆☆☆☆
<p>The more stars (or the higher score) the better. ☆☆☆☆☆ = Very dissatisfied (= 1). ☆☆☆☆☆ = Dissatisfied (= 2). ☆☆☆☆☆ = Medium (=3). ☆☆☆☆☆ = Satisfied (= 4). ☆☆☆☆☆ = Very satisfied (= 5).</p>				

Daily traffic flows		Fleet		Passengers and small freight						Change in past year		
	Normal	Busy	Disrupted	Impassable	No of vehicles operating on road	Trip transport		Daily transport			Annual transport	
						normal day		normal day			adjusted for traffic fluctuations ¹¹	
						per vehicle		all vehicles				
						Pax	Frts	Pax	Frts		Pax	Frts
						(no)	(kg)	(no)	(kg)		(no)	(t)
14	15	16	17	18	19							
Pickup/ Freight	5	2	0	0	5	10	60	50	300	12,010	194	+
Motorcycle	60	500	20	6	30	2	25	120	2,949	84,853	1,216	+
Totals	65	502	20	6	35	12	85	170	3,249	96,863	1,410	

Table 3. Rural transport services key operational statistics for major transport modes



		
	Pickup/freight	Motorcycle
Contribution to annual passenger transport (% of market)	12	88
Contribution to annual small freight transport (% of market)	13	87
Fare per km in USDc	20	24
Journey time (average speed on normal days) in km/hr	11	25
Transport frequency on normal days (number of opportunities to travel per day)	2	22
Number of days a year with 'normal service'	197	248
Number of busy days a year	48	37
Number of days a year with disrupted service	60	50
Number of days a year with no transport services	60	30
Reliability factor(s) (%)	97	36
Men as % of passengers/day	100	73
Women as % of passengers/day	0	23
Children as % of passengers/day	0	4
Cost of 50 kg accompanied freight in USDc per tonne-km	135	109
Cost of 200 kg consigned freight in USDc per tonne-km	112	57
Safety: Recalled no. of accidents per 100,000 vehicle trip	253	751
Security: Recalled no. of incidents per 100,000 vehicle trip	0	35
Typical age of vehicle	No data	No data
Typical fuel consumption of vehicles (litres per 100 km)	No data	No data
Typical operating distance per year in km	No data	No data
Daily hire charge for use of vehicle (entrepreneurial mode)	No data	No data
Total revenue per day (USD)	No data	No data
Total revenue per kilometre (USDc)	No data	No data
Total revenue per passenger kilometre (USDc)	No data	No data
Percentage total revenue due to freight (%)	No data	No data
Regulation compliance (overall assessment) n=2	-	2
Development impact (overall assessment) n=4	3	3

Table 4: User satisfaction with main RTS modes (disaggregated for gender)

	Pickup/freight		Light truck		Motorcycle	
	Men	Women	Men	Women	Men	Women
Sample size (N)	2	1	2	1	11	7
Fares	★☆☆☆☆	★★★★★	★★★☆☆	★★☆☆☆	★★★★★	★★★★★
Journey time	★★☆☆☆	★★☆☆☆	★★☆☆☆	★★☆☆☆	★★★★★	★★★★★
Operational features	★★☆☆☆	★☆☆☆☆	★★☆☆☆	★★☆☆☆	★★★★★	★★★★★
Freight	★★☆☆☆	★★★★★	★★☆☆☆	★★☆☆☆	★★★★★	★★★★★
Safety and security	★★☆☆☆	★★☆☆☆	★★☆☆☆	★★☆☆☆	★★★★★	★★★★★
Comfort	★★☆☆☆	★★☆☆☆	★★☆☆☆	★★☆☆☆	★★★★★	★★★★★
Universal access	★★☆☆☆	★★☆☆☆	★★☆☆☆	★★☆☆☆	★★★★★	★★★★★
Overall satisfaction	2.0	2.3	2.2	2.0	3.2	3.2
<p>The higher the score the better. ★☆☆☆☆ = Very Dissatisfied, ★★☆☆☆ = Dissatisfied, ★★★☆☆ = Medium Satisfied, ★★★★☆ = Satisfied, ★★★★★ = Very Satisfied</p>						

4 Rural transport services

4.1 Overview of road situation and issues

Hub and Spoke patterns

The 31.3 km Kabala-Bafodia road runs in a North-Western direction from Kabala through the Wara Ware Mountains to Bafodia. The rather outdated Oxford printed map of Sierra Leone (no date) suggests that the surveyed road is a ‘main road, paved’ but there are no indications that the road was ever paved. Kabala, the district capital of Koinadugu district, is at the end of a paved highway – in good condition – coming from Makeni, the capital of the Northern Province. A further paved highway runs from Makeni to Freetown. The journey from Kabala to Freetown, as undertaken by a number of mini/midi buses leaving the Kabala car park, is therefore a smooth one taking about five hours. From Kabala, a gravel road runs to the Guinea border town of Gberia Fotombu. The condition of this road is bad, and as a result, the border crossing is not a significant one. Sections of the surveyed road are currently under maintenance. The road is under the authority of the Koinadugu District Council.



Figure 1 (left): Road maintenance equipment left in the middle of the road.

Figure 2 (right): A truck returning from work on the Kamakwie-Bafodia road.

Travelling from Kabala there are 6 villages along the surveyed road before reaching Bafodia. These are respectively: Yagala, Kamabongo, Katawuya, Siamamaia, Yakobi and Semamaya. One then

reaches the Bafodia-Sakuta junction, and turning left, Bafodia will be the next village. Just after the Bafodia-Sakuta junction, on the road to Bafodia, one can take another left turn to the sizeable village of Porpon.

Road characteristics and accessibility

The physical condition of the surveyed road is mixed: some sections, and in particular the flatter ones, are in fairly good condition while other more steeper sections have some deep run-off channels cutting through the middle of the road. An average speed of 25.3 km/h recorded by the team is quite telling, particular since this was recorded by a 4x4 with just two researchers and a driver. A fully loaded pickup truck, would easily take twice the time, plus stopping to pick up and drop off passengers and freight. Hence, the preference for the much faster MCTs is understandable, with users indicating that it takes about an hour on a MCT from Kabala to Bafodia during the dry season.

Population and recent history

Most of the people living in the road catchment area are either from the Limba, Mandigo or Fula ethnic group. There are some other ethnic groups but none of the interviewees indicated that there were ethnic tensions or marginalisation of certain ethnic minorities. Given their somewhat cut-off or end of the line location, Kabala and Bafodia were saved from most of the civil war violence (1991-2002) except for the latter part when S.A.J. Musa – a military commander under both the NPRC and AFRC - set up base at Kabala. Again, in 2014, when the Ebola Virus Disease outbreak started and ravished Sierra Leone, Liberia and Guinea, leading to more than 25,000 deaths, Koinadugu was spared the worst of it. This was mainly because of the low population density, although the relation between the spread of the disease and unsafe burial rituals posed a challenge in this mainly Islamic part of the country.

Market Characteristics

Kabala has no specific market day, but it instead has a daily influx of mainly agricultural products from the rural surroundings and an outflux of consumer items to these areas. The village of Sakuta, about 7 km away from Bafodia situated along the Bafodia-Dogoloya-Kabala road, has a weekly farmers' market. Here, farmers and traders meet from the Bafodia and Sakuta catchment areas, who consider the trip to Kabala to not be economically viable in light of the quantities they trade. Sakuta itself is just a small village, and it is therefore no surprise that Bafodia tries to establish itself as the main market town for the area. Once the Kamakwie-Kabala road is navigable it will likely succeed in becoming the market town for the area, with a weekly market.



Figure 3 (left): the small village of Sakuta where the weekly market is held.

Figure 4 (right): agricultural field in the valley visited by a cow.

Social Amenities

As a district capital, Kabala has many facilities, including: a hospital; government buildings; a police station; a bank; and secondary schools. Bafodia has a clinic, a primary school, a junior and senior high school and a police station. Some of the larger villages along the road also have primary schools. In this mountainous terrain, mobile phone coverage is difficult and spot depended. At the time of the research one of the major mobile phone providers was installing a new mast which would bring mobile phone coverage to Bafodia. However, they experienced a set-back when it collapsed, killing one worker in the process.

Climate and Agricultural Characteristics

The climate in Koinadugu is characterised by a dry season (October to May) and a rainy season (June – September). So far in the North of the country (and away from the ocean) the rainy season is not only shorter but also less intense. Nevertheless, the topography can result in localised flash-floods. While the overall amount of rain is considerably less than in most other parts of the country, the steep sections of the surveyed road result in at least two weeks per year of no transport service and another 3.5 months of disrupted service. To illustrate, over the 31.3 km, the road ascends 615 m and descends 733 m, with its highest point at 717 m and its lowest point at 330 m.

The land is not particularly fertile, except for the inland valley swamps. These valleys all have a spring or river flowing through them, providing ideal areas for rice cultivation. In some areas these valleys are relatively wide and make it possible to cultivate many acres of rice (and other crops), while in other areas the valley base can be just 10 or 20 m wide, restricting the land available for this type of rice cultivation. Slash and burn agriculture – upland rice

Roads and forest resources

The opening up of forested regions in the tropics via roads is a well-established factor in accelerating deforestation and the commercialisation of 'bush meat' hunting and non-timber forest products. While forest exploitation is recognised as a potential vehicle to alleviate poverty, it is important that this is done in a sustainable manner which benefits local communities. Not all types of roads are likely to enable these practices to the same extent and provide equal benefits to local communities. This is mainly down to the mode of transport that can travel on the road. Feeder roads allow for conventional traffic, including trucks which have the capacity to transport significant amounts of timber. Moreover, few of the truck associated loggers are from the communities themselves. These loggers often serve urban markets, where demand for bush-meat – on top of the timber - can be considerable. Alternatively, trails or roads which are mainly frequented by motorcycle taxis and 4 wheeled vehicles are less likely to see large scale logging activities. The occasional pickup truck may collect planks and some bush meat and other forest resources may be transported, but likely on a much smaller scale, and therefore more sustainable and in a more beneficial manner to the communities. Source?

farms and sharecropping – takes place on the hills. Again, the areas close to the valley base are preferred as these give some access to water. Also, some hill sections are just too steep for crop cultivation. Other crops cultivated include millet and maize (better suited to the drier climate), vegetables such as peppers and okra, and fruit trees such as orange and mango. Livestock, all roaming freely, in the form of sheep, goats and in particular cows, is abundant. As mentioned, cows pose a safety hazard for road users and most MTC riders had experienced accidents as the result of a cow suddenly appearing from the side-growth and crossing the road.



Figure 5 (left): MCT rider passing a logging site close to the Bafodia-Sakuta junction. ReCAP and DfID do not endorse unsafe riding practices.

Figure 6 (right): Local loggers at work near the Kabala-Bafodia road.

4.2 Transport services situation and issues

Transport services on the Kabala–Bafodia road are completely dominated by the motorcycle taxi. On non-market days no other public transport services are available, although it is possible to charter a pickup truck. Most of the villages along the surveyed road have their own resident MCT riders. For instance, Yagala has about ten resident MCT riders who charge Le 3000 for a trip to Kabala, while the more distant village of Katawuya has three MCT riders resident who charge between Le 8000 and 10,000 for the Kabala trip. The importance of having resident MCT riders should not be

Tracks and Trails

Feeder roads are generally the ‘lowest’ form of road construction under the responsibility of the Government. Their impact on socio-economic development has been well established. However, this impact is calculated on cost-benefit analyses for conventional modes of transport. Over the last 15 years or so, public transport services in rural Sierra Leone have undergone a dramatic change, with motorcycle taxis (MCTs) becoming the most common and in some cases, only form of transport service available for rural communities. MCTs do not need wide feeder roads with water-crossings engineered for multi-tonnes loads. All they need is a trail – often an upgraded footpath – of about 2 metres wide and simple wooden bridges, replacing existing stick-bridges. A pilot project in Northern Liberia is currently assessing the socio-economic impact of such trails. The trails constructed are less than a tenth of the price per kilometre than the feeder roads in the area, and are overwhelmingly built with locally sourced labour and materials, giving a further cash-injection to the rural economies. The path referred to earlier, providing a short-cut from Kamba to Kabala, would be an ideal candidate to be upgraded to a motorcycle taxis accessible trail.

underestimated. Not only does this give access to emergency motorised transportation twenty-four hours a day, but it increases the likelihood of being able to get transport in the first place, particularly for people living in one of the villages along the road. To illustrate, the smaller village of Kamabonga has no resident MCT riders and villagers indicated that they wait at least an hour and a half before being able to get a MCT. Furthermore, Kamabonga is relatively close to Kabala, so more MCTs will pass as compared to the more distant villages. Across Sierra Leone the MCT has replaced the car taxi, while in other places, such as rural communities connected with footpaths and/or having small populations, the MCT is the first type of motorised transport to arrive. Before the introduction of the MCT, a car taxi/pickup truck visited Bafodia once a week. At the time all those needing to visit Kabala, for instance, waited for the one day on which the vehicle came. On the other days of the week, travelling equalled walking and transporting goods equalled head-loading.



Figure 7 (left): MTCs in Bafodia. ReCAP and DfID do not endorse unsafe riding practices.

Figure 8 (right): Motorcycle repair shop in Bafodia at the start of the Kamakwie-Bafodia road.

Traffic increases during the Sakuta market days, mainly as a result of the MCTs making more trips during that day and because it is more likely that the few for-hire pickup trucks will be hired, for instance by women from the same village joining together for transportation (although this was not picked up by our traffic count).

There is some annual fluctuation in the transport services. The dry season naturally coincides with the harvest season, so the time that the roads are more easily navigable coincides with the time that there is more surplus to sell (and thus more money going around). MTC riders interviewed indicated that during the dry season they will make on average two trips to Kabala per day. During the rainy season one trip a day is more likely, but there will also be days on which they do not make a single trip. During market days, at least three trips are made to the market.

As mentioned, Kabala does not have a specific market day, but it attracts people from the road's catchment area throughout the week. The Sakuta market is an important market for people residing towards the end of the Kabala-Bafodia road. The traffic counts clearly show this. Motorcycle taxis were used by both men and women.

With few if any other transport services available on non-market days, the MCTs hold a monopoly position in the transport market. Passengers complained about the high fare cost for the Kabala-Bafodia trip, which costs around Le 30,000 for a single person travelling or Le 25,000 per person if two persons are travelling at the same time. However, villagers appreciated the motorcycles for their presence – before, people just had to walk – and their availability on demand.

4.3 User perspectives

A total of 22 (13 men and 9 women) transport users were interviewed. All of the users commented on the MCT and some had experience with pickup trucks. In a few cases, interviewees indicated that they managed to hitch a lift with one of the trucks involved in the rehabilitation and construction of the Kamakwie-Bafodia road.

Motorcycle taxis are the main form of rural transport available for the population along the Kabala-Bafodia road. Nearly every community had some resident MCT operators, making it easier for people in between the two hubs to find transport. Bafodia has around 15 MCT operators. With transport solely provided by the instant-leaving motorcycles, a common problem at 'end of the line' communities, where car taxis and mini/midi buses only leave if full, resulting in long waiting times, was therefore not experienced.



Figure 9 (left): Female passengers on a MTC close to the Bafodia-Sakuta junction. ReCAP and DfID do not endorse unsafe riding practices.



Figure 10 (right): MTC rider on the relatively flat Bafodia-Dogoloya-Kabala road. ReCAP and DfID do not endorse unsafe riding practices.

MCTs offer the ultimate ‘service on demand’, and where there is mobile phone coverage – which will be very soon in the case of Bafodia – the MCT can even collect you and your freight at your house or farm. Otherwise, a short stroll to the village centre where the MCTs gather will suffice (another favourite hangout place in Bafodia was the small motorcycle repair ‘shop’ at the start of the Bafodia-Kamakwie road). Hence, there is no need for time-tables. In the case of heavier freight having to be transported, villagers indicated that there was the opportunity to hire a pickup truck. This was more popular during the Sakuta market day and during the peak of the harvest season. Often villagers grouped together to share the costs for this. Nevertheless, table 2 shows that the majority of freight on an annual basis was transported by the MCTS. This must be a result of the sheer number of MCTs operating on the road, as compared to limited number of other modes of transport.

The MCT thus provides for the daily transport needs, for emergencies (which do not necessarily have to be of a medical nature) and according to many users, they provided courier services as well. Nearly all the MCT operators based in the village along the surveyed road were either born there or had lived there already for quite some time. With their social ties, they would hardly refuse to pick up an item – or even do a bit of shopping –in Kabala for a small fee.

Table 5: Summary of user satisfaction responses (disaggregated by gender)

<i>Means of transport</i>	Pickup/freight		Light truck		Motorcycle	
<i>Gender of respondent</i>	M	F	M	F	M	F
<i>Sample size (N)</i>	2	1	2	1	11	7
Passenger fares						
Journey times						
Service frequency						
Service predictability						
Passenger capacity						
Small freight availability						
Small freight charges						
Small freight handling						
Medium freight availability						
Medium freight charges						
Medium freight handling						
Courier services						
Road safety						
Security						
Comfort: space						
Comfort: seat type/conditions						
Comfort: surrounding baggage						
Comfort: environment						
Access for vulnerable people						
Overall un-weighted	2.0	2.3	2.1	2.0	3.2	3.3
Satisfaction for all transport types						
<i>Gender of respondent</i>	M		F			
Facilities at roadside stops	2		2			
Feeding intermodal connectivity	3		2			
Linking intermodal connectivity	3		2			
Overall un-weighted	2.5		2.2			
<p><i>The higher the score the better. =Very Dissatisfied, =Dissatisfied, =Medium Satisfied, =Satisfied, =Very Satisfied</i></p>						

Road safety and security, both relating to MCT transport, were considered moderately satisfactory by the users. Normally, where there are other modes of transport, motorcycles are generally considered to be the most unsafe form of transport. However, there was little to compare the MTCs with on the Kabala-Bafodia road. Security wise, no incidents were recalled. Moreover, many of the female interviewees indicated that they would travel only with an MTC rider who was familiar to them. Road safety is partly related to the road itself, with the steep sections becoming particularly dangerous during the rainy season (even some MCT operators indicated that there were times that they were unwilling to travel). But it seems that the real danger is posed by the cows, which can suddenly appear from the bush and cross the road right in front of the motorcycle. Furthermore, the cows seem to like the open space of the road and are very unpredictable in their movements, so even if it appears to be moving out of the way, within a split second the cow can change its course and knock over the motorcycle with operator and passenger(s). Users indicated that preventing the operator from going too quickly goes some way in preventing accidents.

Road Safety and Motorcycle Taxis

For all its blessings, such as quick, door-to-door journeys and providing millions of young people in Sub Sahara Africa with a livelihood, motorcycle taxis have come with their own set of problems. Perhaps most prominent among these are concerns about road safety. Riders are seen as reckless and prominent to not following the road rules. In an increasing number of African cities MCTs are banned (or at least from the main roads) and some countries have gone as far as banning motorcycle transport for commercial purposes completely (e.g. Ghana, although it is currently considering to partly reverse this legislation). Precise data on accidents involving MCTs in rural areas is limited, but the number seems to be smaller: bad roads often reduce the speed, and so does overloading (very common in rural areas). Moreover, lower traffic volumes make it safer too. But is there an alternative for the omni-present MTC? In 2016 the passenger tricycle arrived in Freetown and is rapidly becoming popular. Both rider and passenger are better protected, not only against the sun or rain, but also in case of an accident. The tricycle or 'ke-ke' needs paved roads, so is unlikely to operate on unpaved feeder roads. However, the cargo motor tricycle can be an outcome here. Already used in a few places, these machines can take both freight (official up to 800kg) and passengers, and deal with fairly rough terrain and elevations. They cost around 3 times as much as a motorcycle but their extra capacity would make it an economic choice (and offering rural inhabitants a cheaper form of transport than the MCTs). Evidence from Northern Ghana showed that few if any of these were involved in accidents, and even if they were, these were seldom of a serious nature.



Figure 11 (left): Older villager who was recently involved in a MCT accident.



Figure 12 (right): Evidence of road works close to Bafodia.

All respondents were dissatisfied with the road-side waiting facilities. This is of little surprise as they were non-existent. However, with the motorcycle taxis going on demand, road-side facilities are

hardly necessary except perhaps for the one or two communities which do not (yet) have resident MTCs.

4.4 Operator perspectives

Seven operators of motorcycle taxis were interviewed and one operator of a pickup truck was interviewed. One of the MTC riders interviewed in Bafodia was a 24 year old man. For the last three years he has been an owner/operator, meaning that all profits will go to him (although he must also cover all costs). Before he became the owner, he was an operator of someone else's motorcycle, paying a daily rent. Unfortunately, due to the sometimes complex rental agreements – including who pays for which types of repairs, it proved to be difficult to gather meaningful Vehicle Operating Costs (VOC). Hence, the lack of this data in table 3. As written above, on normal days a MTC rider in Bafodia can expect to make two trips to Kabala, while on the market days three trips are made on average, mainly to Sakuta. Given the nature of the road – in bad condition and with steep gradients – operators normally take either one or two passengers. However, they are reluctant to take more passengers and limit freight to around 100 kg. There is a slow but steady increase in the number of MTCs operating along the road, but the number of trips a rider makes each day has remained the same. Hence, there is a slow but steady increase in the number of people travelling. Again, once the Kamakwie-Bafodia-Kabala road has opened this may increase, since Bafodia will no longer be at the end of the road. At the moment, MTCs charge Le 250,000 for the Kamakwie-Bafodia trip, which includes a ferry crossing, but few if any people make that trip.

The MTCs provide great employment opportunities for young people, originally in the urban areas and

since the last decade increasingly for youth in rural areas as well. In many cases, for each MTC on the road there are two and sometimes three different riders, taking turns and earning a bit of extra money. Moreover, every village with more than a handful of MTCs is likely to have a small repair shop, providing further employment for the youth. Finally there are the bike-washers, earning a few thousand Leones for each bike to clean. All this is on top of the contributions to socio-economic development as a result of better connectivity. In Bafodia there is a small repair shop with a 'bossman' and two or three apprentices. The MTC operators have all their regular repair requirements done here, except for welding, which has to be done in Kabala.

The "C" word

Unfortunately, all operators report widespread police-corruption. At police barriers, particular prominent on market days, operators have to pay police a bribe, depending on the size of the vehicle. This is irrespective of whether permits and papers are in order and irrespective of if the mode of transport has any technical or regulatory defaults. In any case, with so many rules and regulations – and few of these seem to reflect the reality and importance of rural transport – there is always something to find and fine for the police. Operators unwilling (or unable) to pay will have their mode of transport confiscated. This is particularly common for MCT riders. The price of the bribe will further increase and if still no payment is made, the case is transferred to the court. A hearing will take place, often in absence of the arresting officer, and if one pleads 'not guilty', a date is set for the full hearing. In the meantime, one will be imprisoned. With no relation between compliance (concerning both vehicle and driver) and the 'fine' paid at the checkpoint, there is no contribution to compliance and thus road safety at all. Introducing more stringent rules and regulations will only give even more opportunities to extract money from operators.



Figure 13 (left): Start of the footpath near Kamba which is considered for upgrading.

Figure 12 (centre): Run off channels in the middle of the Kabala-Bafodia road on the steeper sections.

Figure 13 (right): Both young and old are using MCTs. ReCAP and DfID do not endorse unsafe riding practices.

Security is not a major issue, but the MCT operators indicated that they normally do not like to ride during the night-time in case the passenger(s) connive with robbers. Motorcycle theft has taken place in the past. Safety wise, the issue of the cows (discussed above) was brought up. The condition of the road is an issue too, both during the rainy season for obvious reasons and during the dry season when the temptation is there to speed. Finally, there is a checkpoint on the outskirts of Kabala where MTCs pay Le 5000. The only reason for paying is to prevent any harassment by the police. If one refuses to make the token payment there is a real chance that you will be charged to pay Le 50,000, irrespective of whether your motorcycle is in good order or not, or so the MTC riders claim.

Table 6: Summary of operator perspectives

Means of transport	Pickup/freight	Motorcycle
Sample size (N)	1	7
Road condition for operations	☆☆☆☆	☆☆☆☆
Adequacy of working capital	☆☆☆☆	☆☆☆☆
Facilities for formal credit	☆☆☆☆	☆☆☆☆
Facilities for informal credit	☆☆☆☆	☆☆☆☆
Adequacy of technical facilities	☆☆☆☆	☆☆☆☆
Regulatory disincentives	☆☆☆☆	☆☆☆☆
Regulatory incentives	☆☆☆☆	☆☆☆☆
Active associations	☆☆☆☆	☆☆☆☆
Security risks	☆☆☆☆	☆☆☆☆
Un-weighted average	2.9	2.5
<i>The higher the score the better. ☆☆☆☆☆=Very Dissatisfied, ☆☆☆☆☆=Dissatisfied, ☆☆☆☆☆=Medium Satisfied, ☆☆☆☆☆=Satisfied, ☆☆☆☆☆=Very Satisfied</i>		

4.5 Regulator perspectives

Just two regulators were interviewed as the team found it hard to identify regulators with knowledge about the surveyed road. In Kabala a police officer and a drivers’ union person were interviewed, but both – while familiar with the Kabala-Bafodia road – had no extensive knowledge of it. Hence, the below scores probably reflect the regulators’ perspectives on light trucks and motorcycles on rural roads in the Koinadugu area more generally. The key observation must be that for both transport modes compliance levels are dissatisfactory. It is acknowledged that the rural roads attract the worst vehicles, as far as compliance is concerned. But given the limited compliance controls and the recognition that these modes of transport are vital for the transport needs of rural people – there seems to be limited capacity and willingness to address this dissatisfactory level of compliance.

Table 7: Summary of regulator perspectives		
Means of transport	Light truck	Motorcycle
Vehicle technical compliance		
Vehicle fiscal compliance		
Insurance compliance		
Operational compliance		
Safety compliance		
Environmental compliance		
Regulatory planning framework		
Safety of the road	-	-
Un-weighted average	1.7	1.9
Number of people interviewed	2	
The higher the score the better. = Very Dissatisfied, = Dissatisfied, = Medium Satisfied, = Satisfied, = Very Satisfied		

4.6 Development perspectives

For development, and the contribution of the public transport services to this, four people were interviewed, including the principal of the Junior and Senior High School in Bafodia. The principal commented on both the MCT and the pickup truck. He also indicated that in the past a tractor was operating in Bafodia area, brought in as part of a donor project, which would take some passengers along whenever moving down the road. However, this tractor broke down some years ago and has not been replaced. Again, pickup trucks are not plying the road according to a schedule, but can be hired by one or more people to make a certain trip.

Table 8: Summary of development perspectives		
Means of transport	Pickup/freight	Motorcycle
Agricultural facilitation	★★★★☆	★★★★☆
Enterprise/trade facilitation	★★★★☆	★★★★☆
Women's empowerment	★★★★☆	★★★★☆
Minority group empowerment	★★★★★	★★★★☆
Disabled people's empowerment	★★★★☆	★★★★☆
Young people's empowerment	★★★★☆	★★★★☆
Maternal health needs	★★★★☆	★★★★☆
Medical service transport	★★★★☆	★★★★☆
Education-related transport	★★★☆☆	★★★★☆
Mobile phone and ICT integration	★★★☆☆	★★★☆☆
Un-weighted average	3.0	3.2
Cultural impact	★★★★☆	★★★★☆
Environment impact	★★★★☆	★★★★☆
HIV/Aids impact	★★★★☆	★★★★☆
Un-weighted average	3.0	2.9
Integration with feeder transport		2
Integration with external transport		2
Road maintenance adequacy		4
Number of interviews		4
<p><i>The higher the score the better, from the development perspective. For example, the contribution of each mode of transport to the achievement of development goals in that area of concern by the people interviewed as: ★☆☆☆☆=Very Poor, ★★☆☆☆=Poor, ★★★☆☆=Medium, ★★★★☆=Good, ★★★★★=Very Good</i></p>		

In general, the MCTs are praised for their ability to go quickly and whenever you need them, while the pickup truck is appreciated for its load capacity and lower price (comparatively). With increasing economic development, it can be expected that harvests will increase and more bulk agriculture will be transported to Kabala, while more building materials, such as cement and zinc roof sheeting will go from Kabala to Bafodia (and the in between communities). As such, it is unlikely that a community can solely depend on the MCTs for its continuous development.



Figure 14 (left): Motorcycle washing shop in Kabala.

Figure 15 (right): Motorcycle repair shop in Bafodia.

The MCT was praised by the principal for its ability to provide (attractive) jobs for the young people in the area, although in some cases it made young people drop out of school to take up the profession, a view echoed by other informants across the country (see other reports). But access to MCTs for teachers was considered as a positive contribution to the education sector by the principal.

Attracting teachers to teach in rural areas is difficult without proper access to transport. Even if the teacher originates from the village, he or she still has to go down to the administrative centre once every month or so to collect their salary. The pickup truck was also praised in relation to young people, as it was occasionally hired by them to play and attend football matches in nearby villages.

4.7 Conclusions

The Kabala-Bafodia surveyed road is quite representative of other feeder roads in the interior plateau zone. The mountainous terrain offers a challenge to the construction and maintenance of roads, and a challenge to the modes of transport navigating these. Hence, it does not come as a surprise when the Bafodia

interviewees indicated that prior to the introduction of the motorcycle taxis, people used to walk and headload their freight. At least this was the case during non-market days. As such, the MCT has been a real game-changer, catalysing market integration by making it possible to produce beyond subsistence levels and marketing the surplus in an urban centre such as Kabala. It also helped to provide better access to education – not so much by providing transport for schoolchildren but by attracting teachers who would be reluctant to come to a place that can only be reached by foot. The MTC also facilitates access to health care, including maternal health care. The tailor-made service and instant departure offered by the MCT has made it difficult for other modes of transport to

Ex-combatants, MTCs and youth employment

The motorcycle taxi or *Okada* phenomenon started in Sierra Leone immediately after the war. During the war, road maintenance, let alone road construction, was non-existent. Moreover, many of the conventional vehicles were either destroyed, or driven to neighbouring Guinea and sold. Young ex-combatants were among the first to take up the MTC business. This was partly because few of them could make a living from the skills they learned as part of the Disarmament, Demobilisation and Reintegration programme. Hence, they looked for other opportunities, and since many of the motorcycles were operated by a small team of riders taking turns, it helped if one could trust the other riders not to ride off with the motorcycle and sell it in another town. As 'Brothers in Arms', there was often this trust, and the businessmen renting out the motorcycles probably liked the idea that these riders knew how to protect themselves and their motorcycle. These days, most riders do not have an ex-combatant background, and MTCs provide a livelihood for hundreds of thousands of young people. It would be hard to think about a sector which could create so many new jobs in such a short period. While urban settings seem to be quite saturated, MTCs numbers in rural settings are still rising.

compete, even though transport users pay a significant premium for their journey by motorcycle. An additional concern for motorcycle taxi transport relates to unsafe transport practices. Helmets are seldom worn by the MTC operators, let alone by the passengers. Furthermore, there can be considerable overloading, both of freight and number of pillion passengers, although the rough and hilly terrain sets a natural limit to how much can be carried by the MTC in one go. But how can safe riding practices be policed, if indeed corrupt practices by police or traffic officers is so widespread, as is suggested by the MTC operators? In this report, a suggestion was made to enhance the impact of the MCT further through the construction of local labour and materials intensive tracks, which is a cheap alternative to feeder road construction. It is also a sufficient alternative for places where nearly all transport takes place by motorcycles, as is the case on the Kabala-Bafodia road. These tracks could accommodate both motorcycles and the cargo motor tricycle, with the latter allowing operators to reduce the very high fares for users due to a bigger pay-load. For roads such as the surveyed road in this study, a (radical) rethink of – and discussion on the feeder road and rural transport services policy is needed now that the MCT is the most dominant – if not only – mode of transport. This discussion should include the question whether or not policy makers are at ease with the very dominant position of the MCT in the rural public transport sector. But the occasional use of the pickup truck on the Bafodia-Kabala road is an indication that the MCT does not and cannot serve all transport needs for everybody at all times. Should the government formulate policy which ensures that there is at least a guaranteed minimum level of non-MCT public transport on offer in rural Sierra Leone? And if so, how will this be implemented and delivered? A scheduled shared taxi or mini-bus service leaving Bafodia in morning and returning in the late afternoon, would give rural dwellers at least one other option. And because it would be running on a fixed schedule, the long filling-up and waiting hours normally associated with shared public transport services in rural areas with limited demand, will be heavily reduced. However, it may require some form of state subsidy to be sufficiently profitable for the operator.