GVEP International

Availability of phone charging services in off-grid areas of the Lake Zone region, Tanzania

This report presents a summary of the findings from research carried out by a local consultant ASEDETA in late 2012.The research was commissioned as part of the Capital Access for Renewable Energy Enterprises (CARE2) funded by the Swedish government.

SWEDEN

Prepared for publication by:

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ACCELERATING ACCESS TO ENERGY

INTRODUCTION

Mobile phones have become an important source of information for various purposes including social, economic, academic and political. In developing countries mobile phone use contributes to economic and social development. In a study carried out by the Sokoine University of Agriculture Tanzania 91% of respondents said that mobile phones had greatly improved their social relationships, 79% said that using mobile phones had improved the efficiency of daily activities and 59% said that using mobile phones had greatly improved the ease of access to information on agricultural produce[1]. Mobile phones can also improve a countries standard of living. Developing countries in Africa that had an average of 10 or more mobile phones per 100 people had a 0.59% higher GDP growth than an otherwise identical country[2]. The increased use of mobile phones has also lead to job creation with the private transport and communications sector in Kenya (having risen) by 130 percent between 2003 and 2007[3].

In Tanzania, about 80% of the population live in rural areas and engage in agriculture. Mobile phones are important to them for keeping in touch with relatives and friends and for commercial transactions. Eighty six percent of households in Tanzania are not connected with the national electricity grid (The World Bank, World Development Indictators, 2009). Ownership of mobile phones is growing. In 2007 there were 8,252,000 people in Tanzania who owned mobile phones this increased to 25,666,455 in 2011 (World Bank, World Development Indicators, 2011) which is an increase of 211**%.** But charging phones is a challenge in rural areas. In 2012 GVEP commissioned ASEDETA to collect information on the mobile phone charging situation, and the socio-economic importance of phones, in rural areas of the Lake Victoria Zone region in Tanzania.

[1]Alfred Said Sife, Elizabeth Kiondo and Joyce G. Lyimo-Macha, (2010)*'Contribution of Mobile Phones to Rural Livelihoods and Poverty Reduction in Morogoro Region, Tanzania',* The Electronic Journal on Information Systems in Developing Countries, 42, 1-15 (p.9-10)

[2]SebastianaEtzo and Guy Collender, (2010) *'Mobile Phone 'Revolution' in Africa: Rhetoric or Reality?'*African Affairs 109, (p.662)

[3]Jenny C. Aker and Isaac M. Mbiti, (2010) '*Mobile Phones and Economic Development in Africa',* The Journal of Economic Perspectives, 24 (p.219)

A total sample size of 320 respondents was obtained for this study. Questionnaires, focus group discussions, researcher's observation and key informant interview methods were used to collect primary data. Study areas as well as households and entrepreneurs were selected randomly.

Various documents related to rural electrification rates and plans as well as other issues related to mobile phones in rural areas of Tanzania were used to obtain secondary data. Both quantitative and qualitative data were analysed. The quantitative data was analysed using SPSS computer software, while the qualitative data was analysed using structural function content analysis. A report was developed on the basis of data collected and analysed.

The main objective of the survey was to establish the situation regarding phone charging in the target areas so as to guide GVEP project implementation and generate parameters for establishing the project impact.

The study shows there is high demand for mobile phone charging in rural areas around Lake Victoria. The majority of mobile phone owners charge in business centres and kiosks where they pay for the services. These charging centres are in most cases a considerable distance from their homes (>4km). The interest of entrepreneurs to engage in mobile phone charging business is high in rural areas of Lake Zone Region. Entrepreneurs would purchase solar phone charging equipment on credit and repay in instalments if this option were available. A majority of the entrepreneurs who were interviewed (64%) preferred payments in instalments.

The study confirms GVEP's prior analysis that there is an opportunity to assist entrepreneurs to establish profitable phone charging businesses in rural areas of Lake Zone region. GVEP intends to provide training to entrepreneurs in all aspects of business management such as record keeping, marketing and business planning. GVEP will enable entrepreneurs to secure loans with which to procure charging equipment. Finally, GVEP plans to introduce cheaper 'plug-and-play' charging kits into the Mwanza area through the existing solar PV supply chain in order to further address issues of affordability. Supply chain issues are discussed in a separate report.

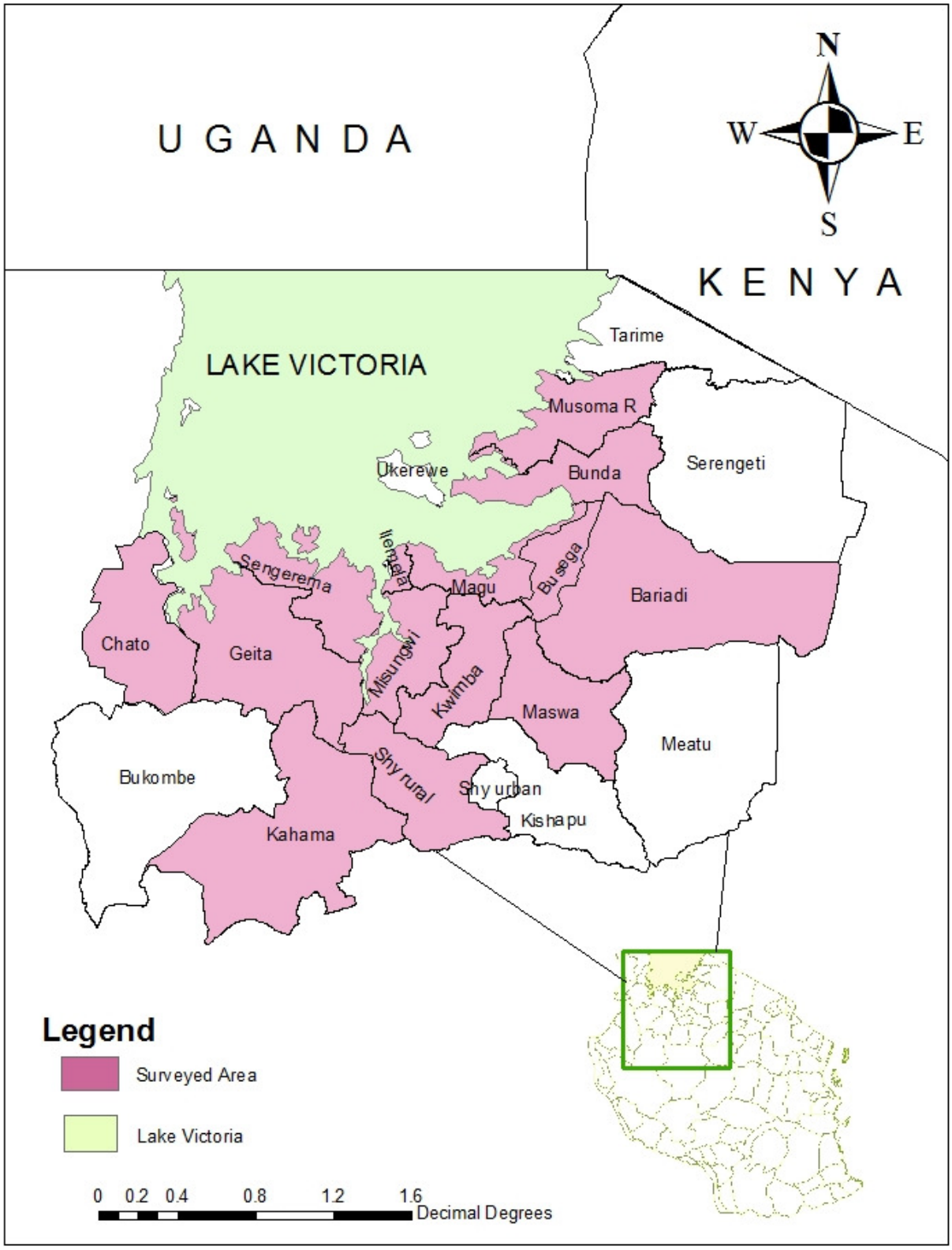


Figure 1: Map showing selected areas for researching

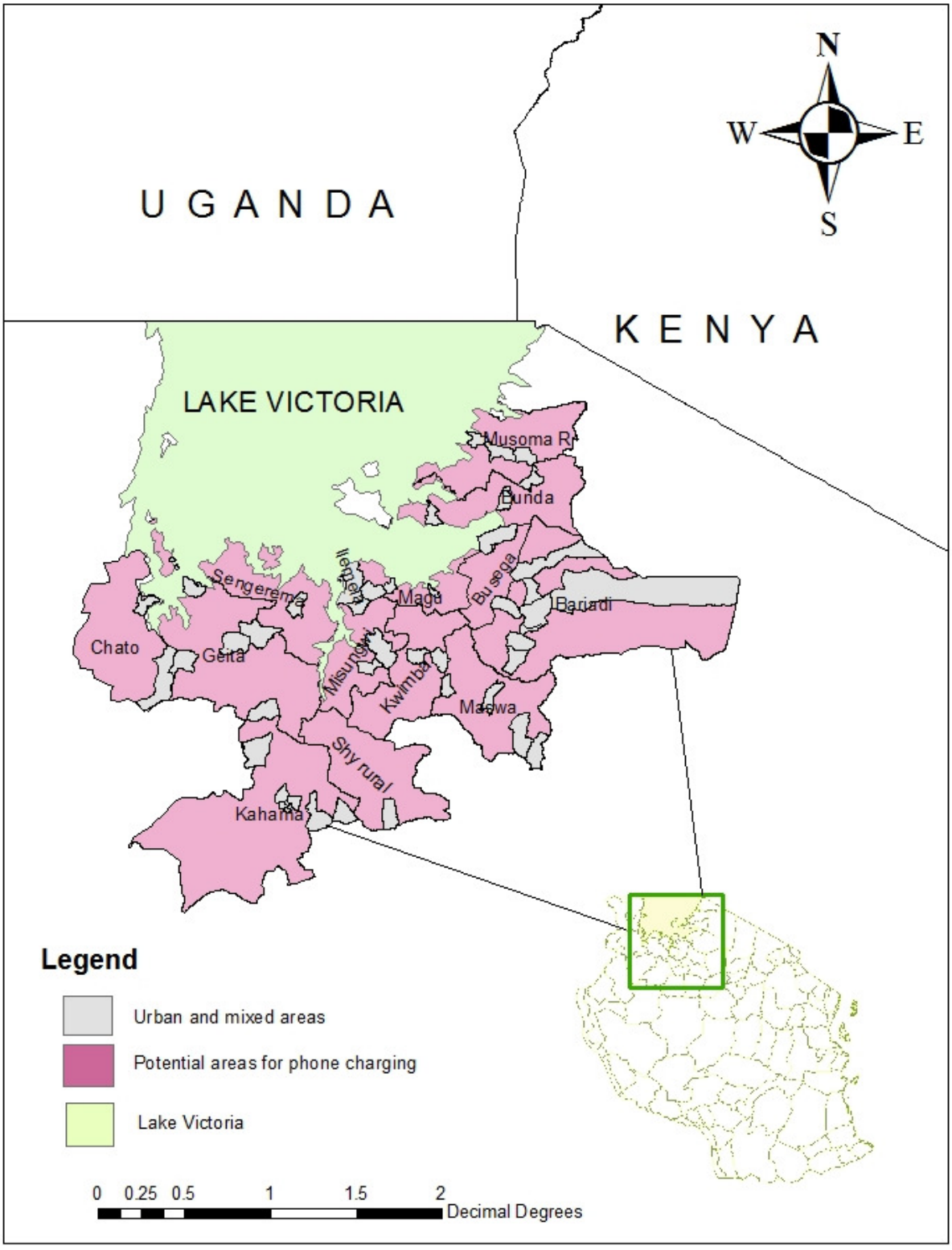


Figure 2: Map showing potential areas for phone charging businesses

FINDINGS FROM THE RESEARCH

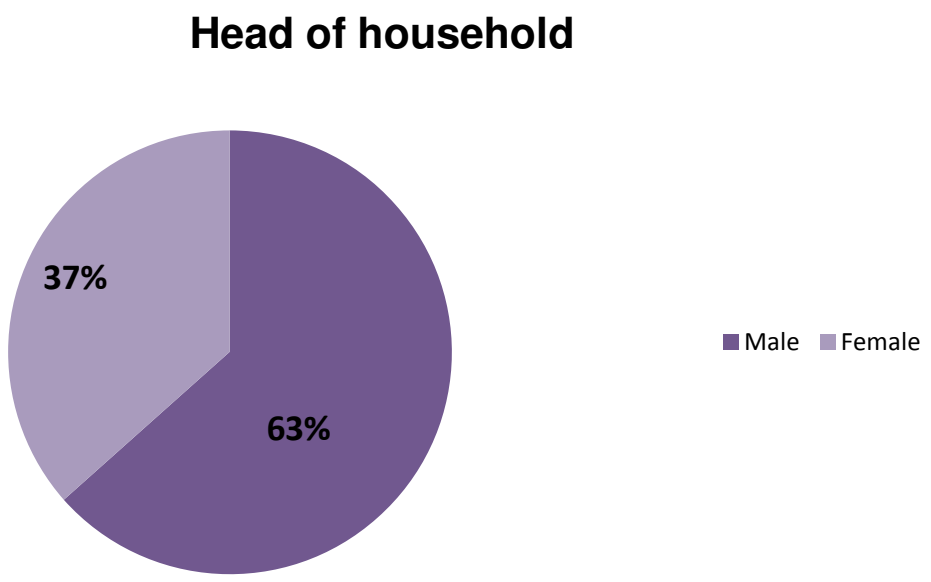
This summary publishes data from the consultant's report and the key findings. The first set of charts presents demographic information about the respondents. The second group of charts covers mobile phone ownership and usage, including how phones are charged. The third section provides data on local micro-entrepreneurs interest in providing charging services.

Profile of survey respondents

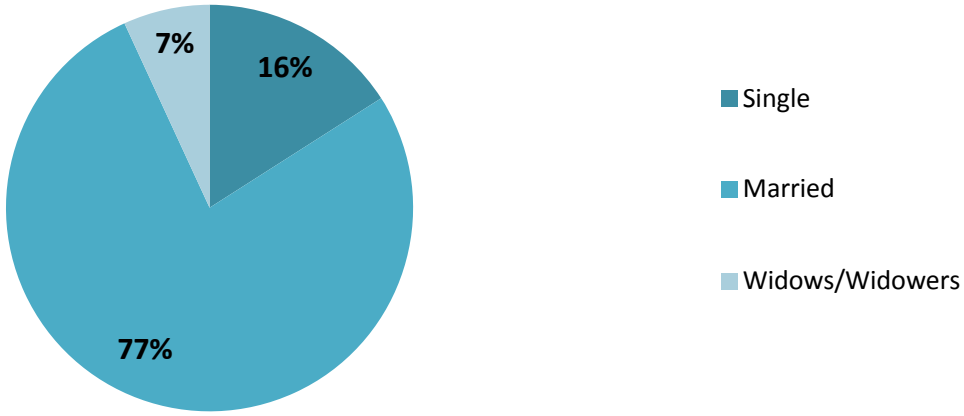
The following graphs present data on the characteristics of the households interviewed.

The common characteristics are:

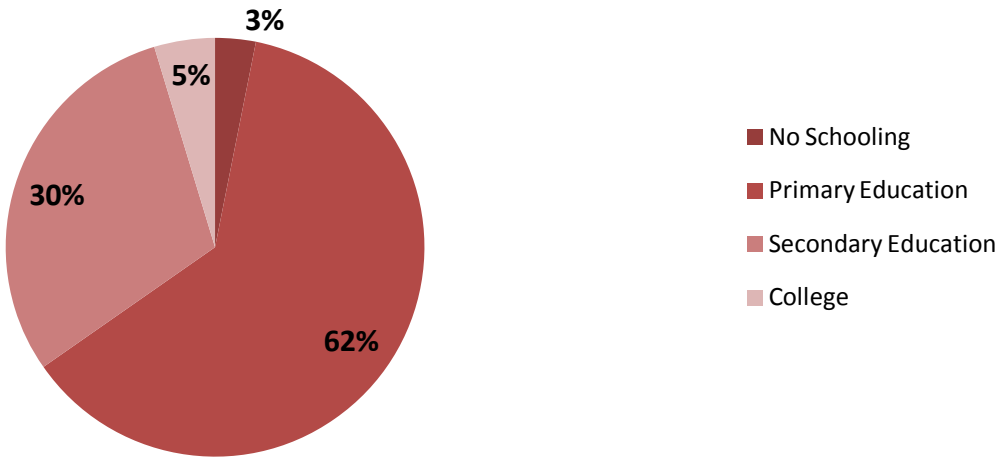
- Male head of household
- Married
- Primary Level Education
- Aged 26-45
- Lives more than 4km away from the national grid
- 1-2 acres of land
- Lives in permanent housing
- Main sources of income are from crop farming
- 2 members of the household are working
- Average income is 135,000-360,000 TZS (83.30-222.12 USD)



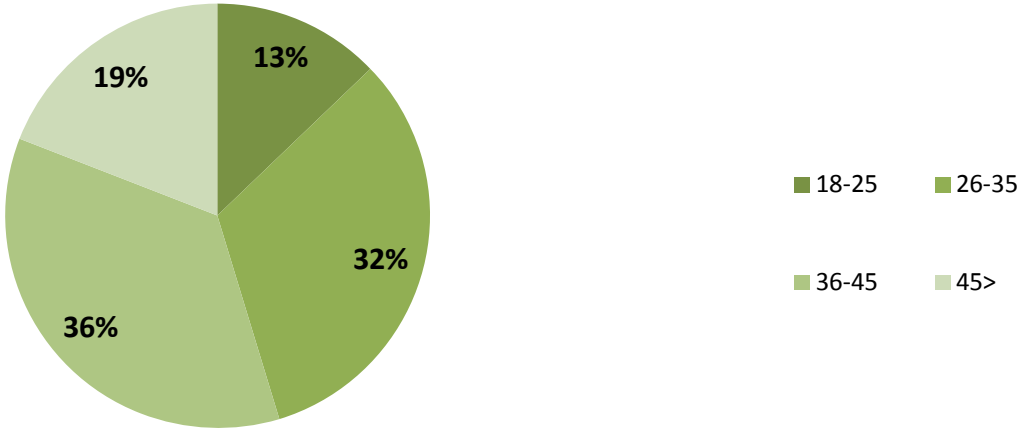
Marital status



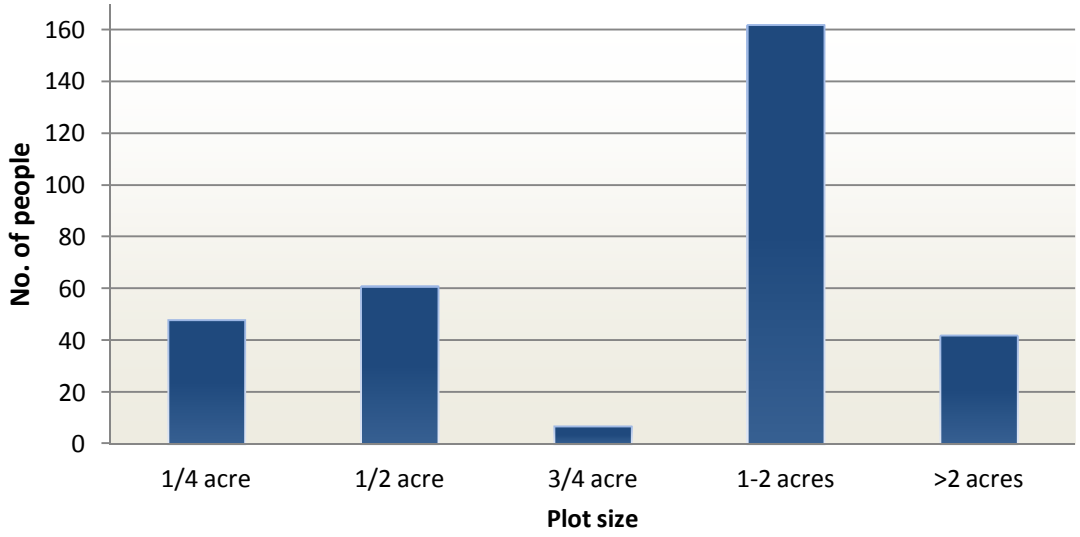
Education levels



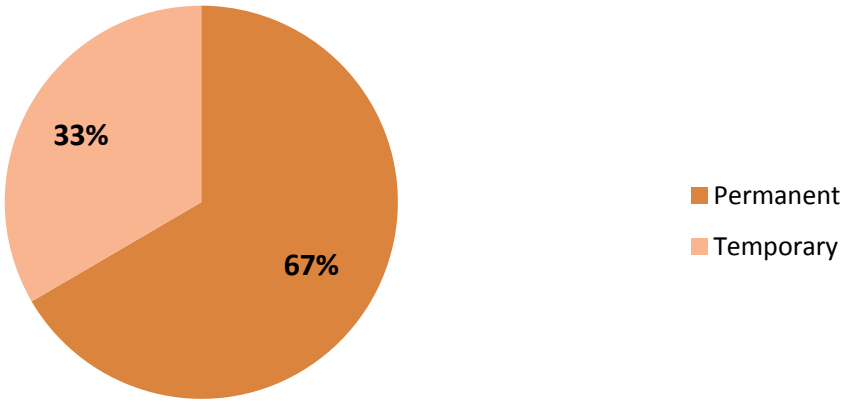
Age of respondants



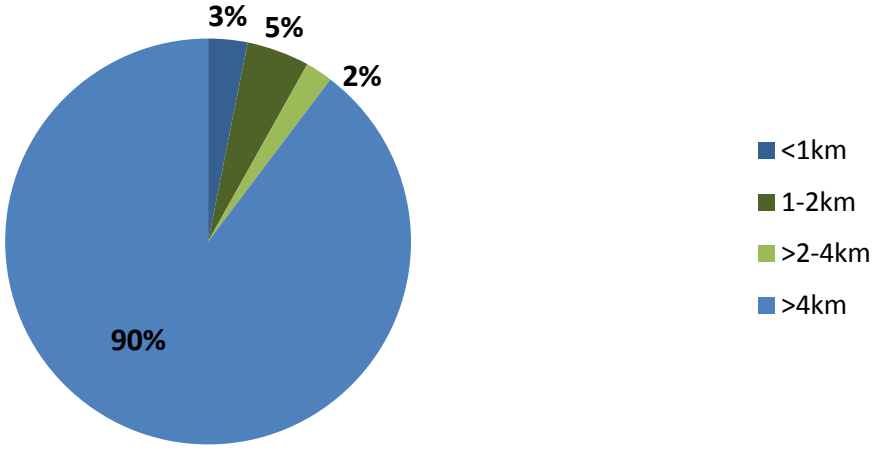
Average plot size

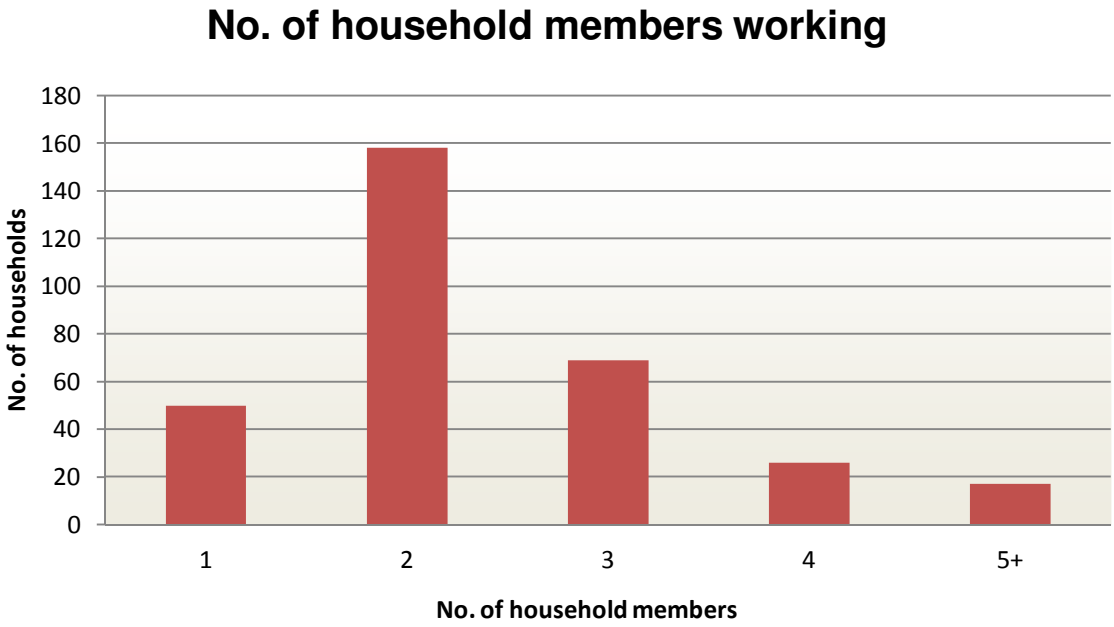


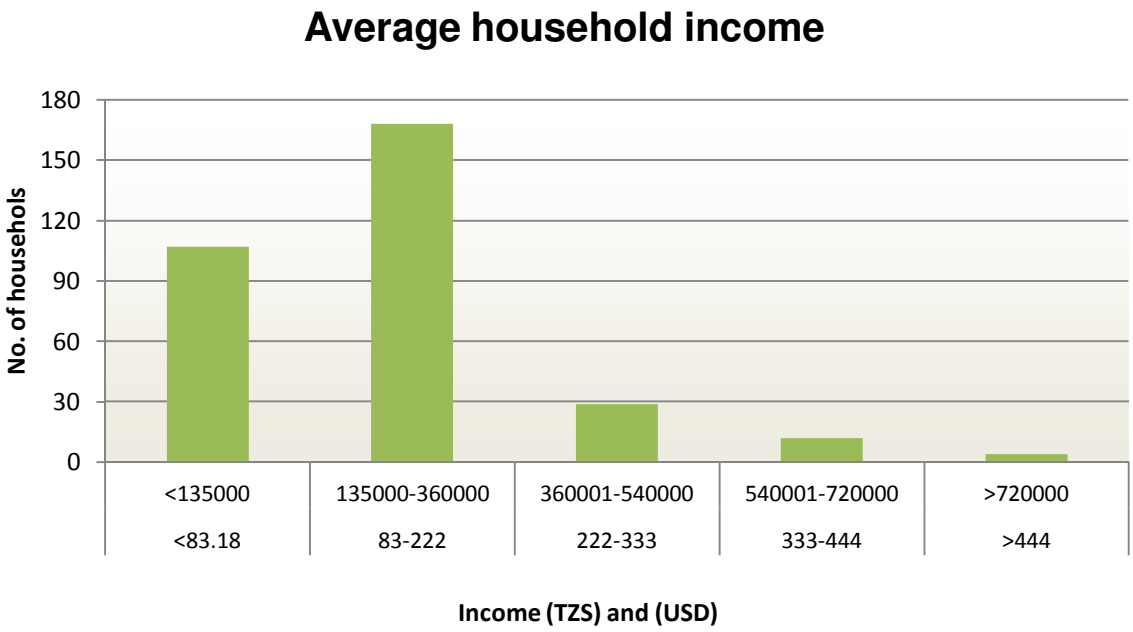
Housing status



Distance households are from the national grid





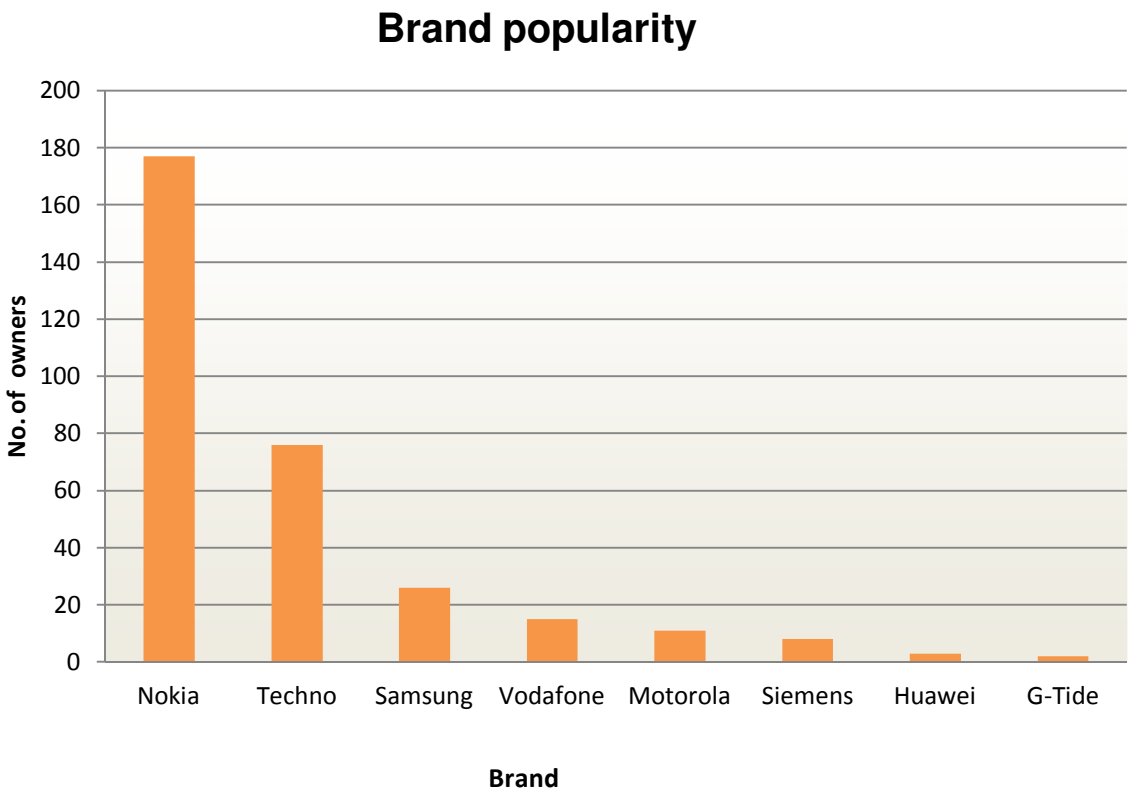


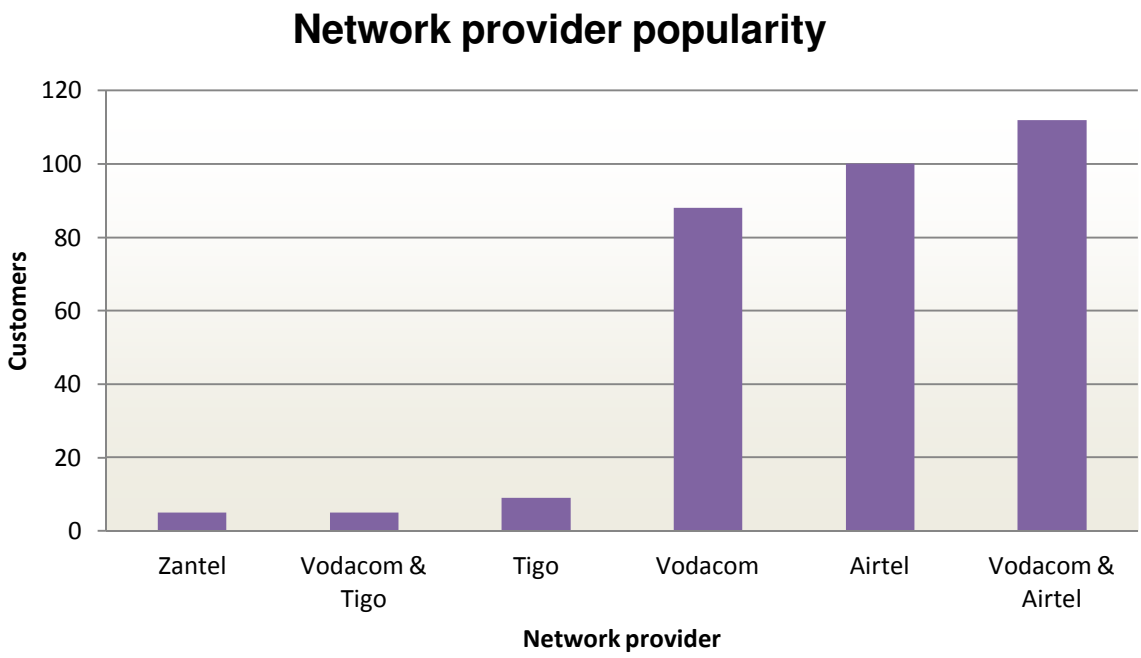
MOBILE PHONE DATA

This section details how mobile phones are used including brands, telecommunication companies, usage, what phones are used for, plus costs and sources of electricity that are used to charge phones.

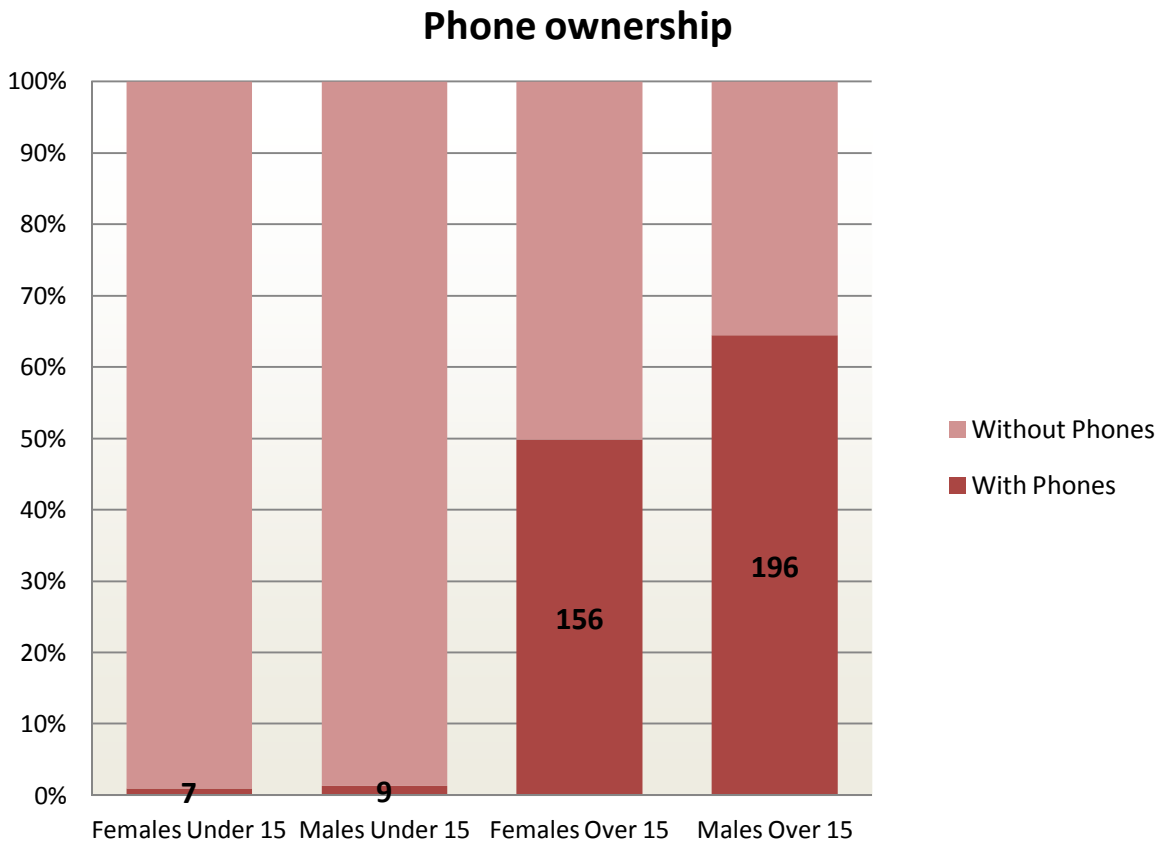
The main findings are:

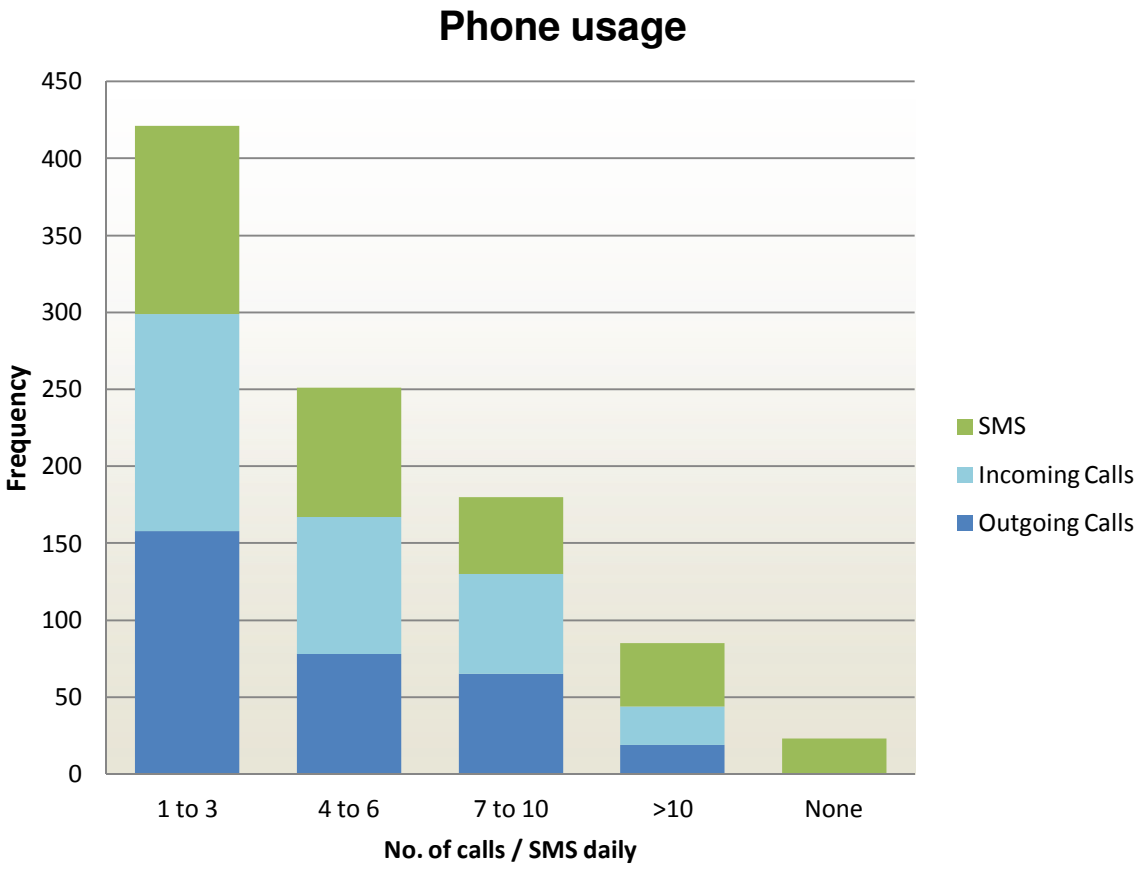
- The most popular mobile phone brand is Nokia
- Vodacom and Airtel are the most popular network providers
- 50% of women over 15 have a mobile phone and 64% of men over 15 have a mobile phone
- On average each day a person will send 1-3 calls and SMS's.
- The cost of using a mobile phone weekly is 1000-2000 TZS (0.6-1.23 USD)
- The most common problem when using mobile phones is poor network access
- 59% of people use mobile phones to keep in touch with customers
- Small business centres are the most common place to buy a mobile phone
- The two most common ways of charging mobile phones is through solar panels or batteries
- To charge their phones customers usually have to walk between 4 and 18km
- It takes 2-3 hours to charge a phone
- Phones are most often charged twice per week
- It cost 300 TZS (0.18 USD) to charge a phone
- Lost phones and accessories was the most commonly reported problem related to charging phones

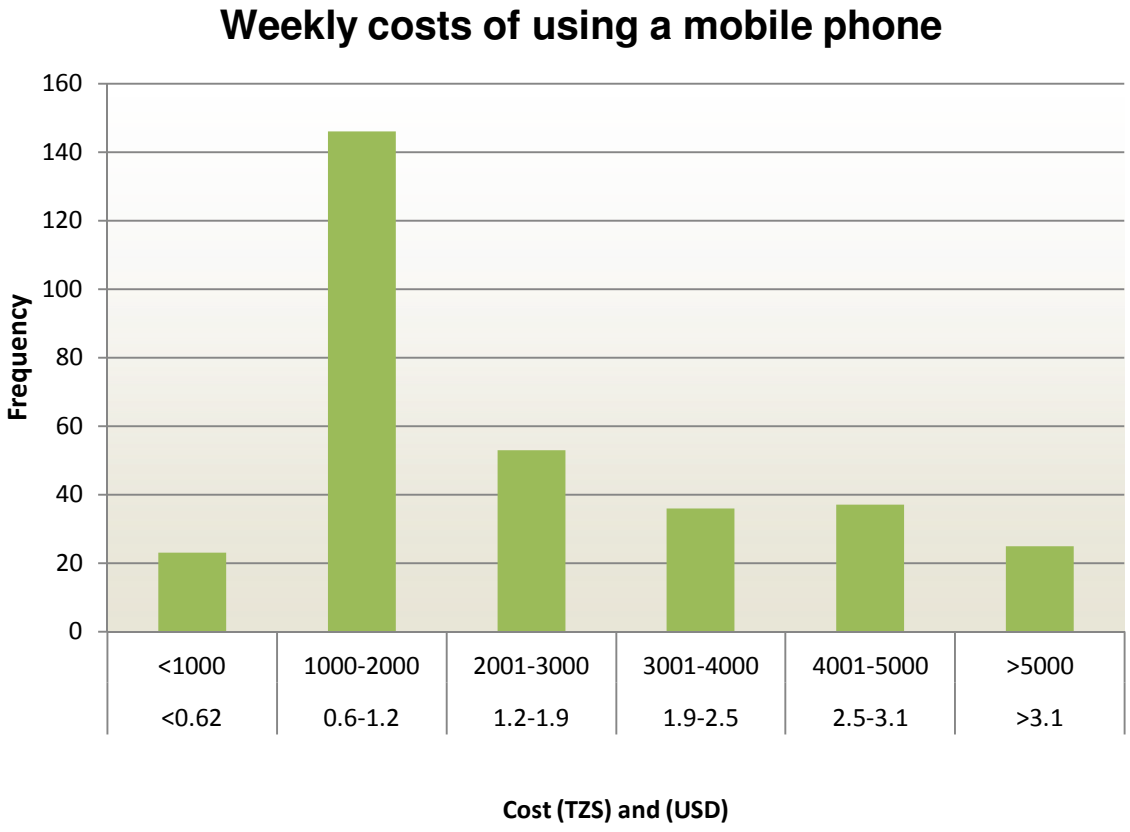




Focus group discussion in Mwabomba village showed that network coverage is a major problem in many rural areas. Sometimes to get a connection subscribers have to travel to where the network is available. However two network systems operate in most rural areas of Lake Zone region, these are Airtel and Vodacom.

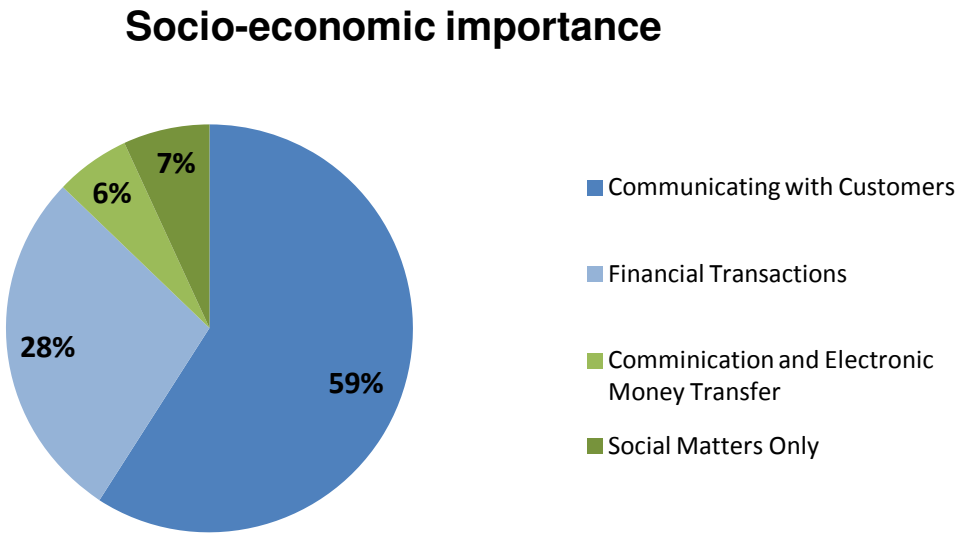



Phone usage
450
400
350
300
250
200
150
100
50
0
Frequency
1 to 3
4 to 6
7 to 10
>10
None
No. of calls / SMS daily
SMS
Incoming Calls
Outgoing Calls


Weekly costs of using a mobile phone
160
140
120
100
80
60
40
20
0
Frequency
<1000
<0.62
1000-2000
0.6-1.2
2001-3000
1.2-1.9
3001-4000
1.9-2.5
4001-5000
2.5-3.1
>5000
>3.1
Cost (TZS) and (USD)

Problems with using mobile phones	Frequency
Unreliable network system	86
Long distance travel	84
Cost of buying airtime	29
None	28
Short Battery life	24
Long Distance & Unreliable Network	22
Unreliable Network, Low Battery Life and High charging cost	21
High charging cost and Long distance	14
High charging cost	12

Focus group discussion showed that challenges encountered in using mobile phones in rural areas include long distances travelled to reach the charging stations and poverty limits regular use of mobile phones. People cannot afford to purchase airtime or pay for charging their mobile phones as often as they would like. It was also reported that charging mobile phones has been a problem during the rainy seasons as solar panels aren't as effective.

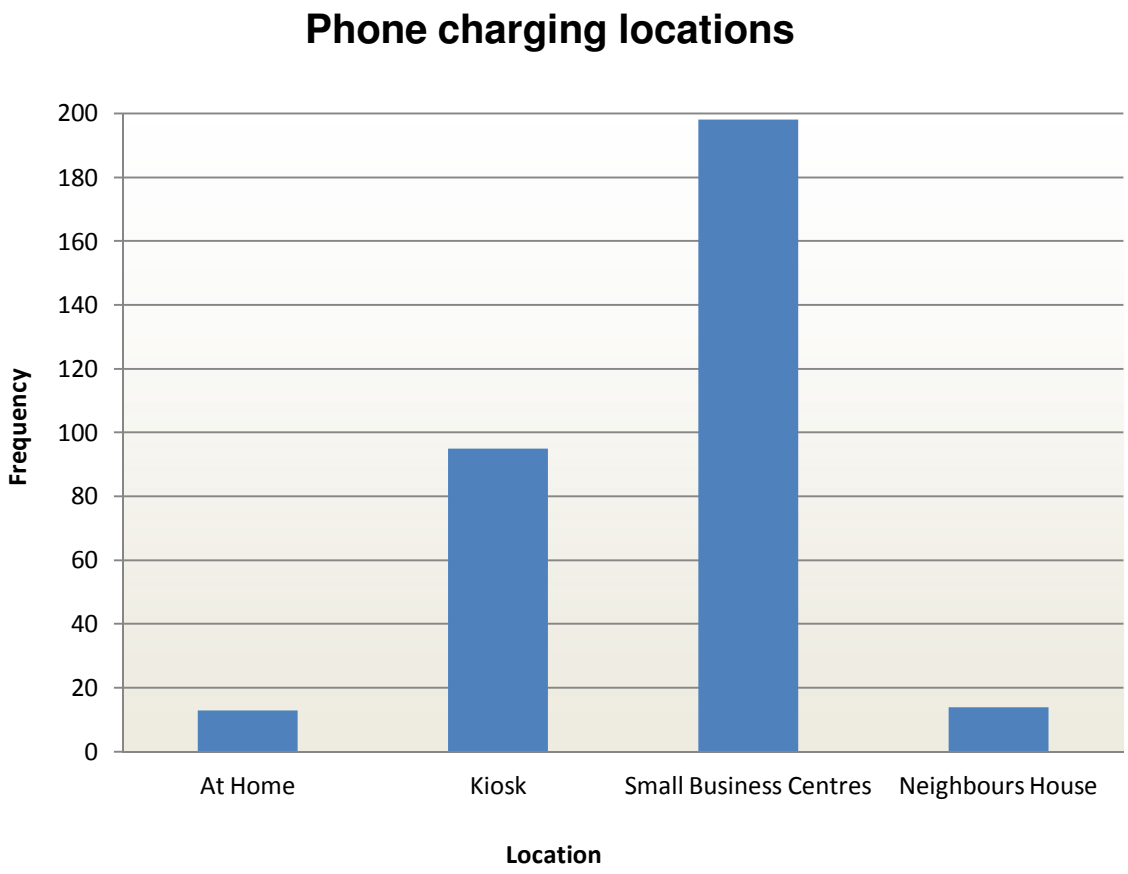


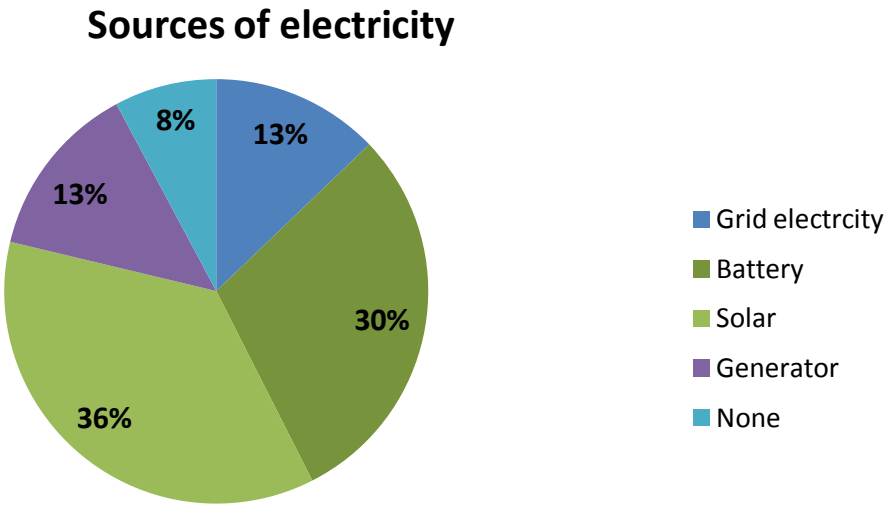
Some interviewees have businesses while others are farmers who use their phones to try to get information about prices of livestock (especially cattle) and crops. Money transfer is an important aspect of phone use. The money transfer referred to the services provided by Airtel money, Tigo-Pesa and Vodacom's M-Pesa. A small number of respondents said that they use their mobile phones for social matters only such as receiving information on cases of sickness, death, traditional rituals and communicating with friends and relatives

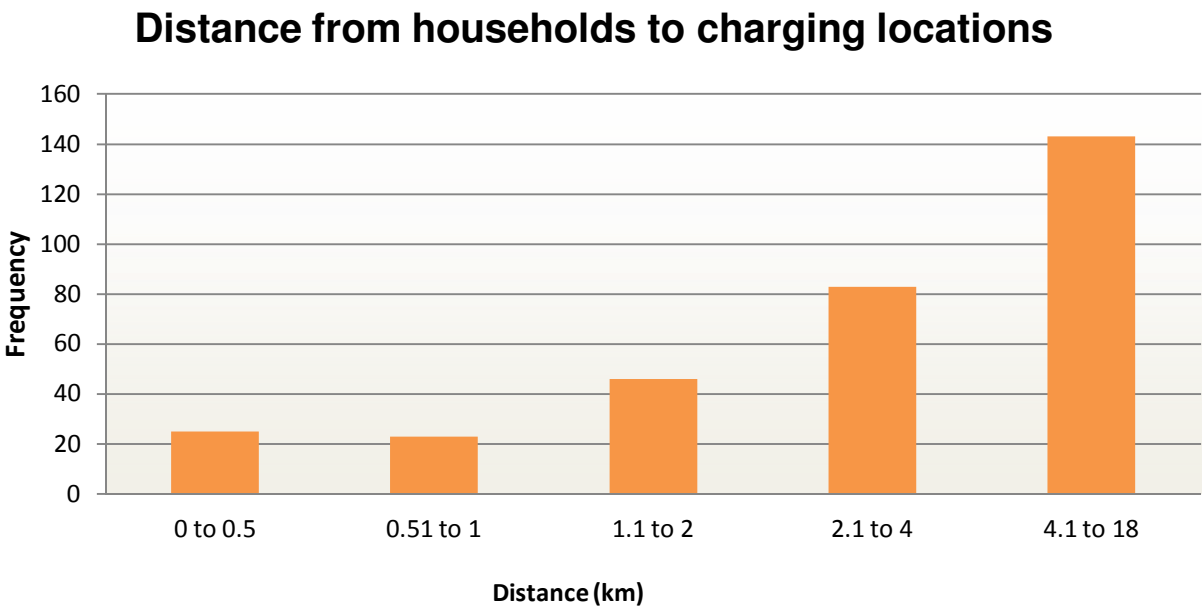
These findings corresponded with insights from the community focus groups in Mbarika, Mwabomba, Rakana and Masengwa where mobile phones have been a good tool for communication at home with family members, relatives and friends. Mobile phones helped them with business communications especially to find markets and prices for crops and animals.

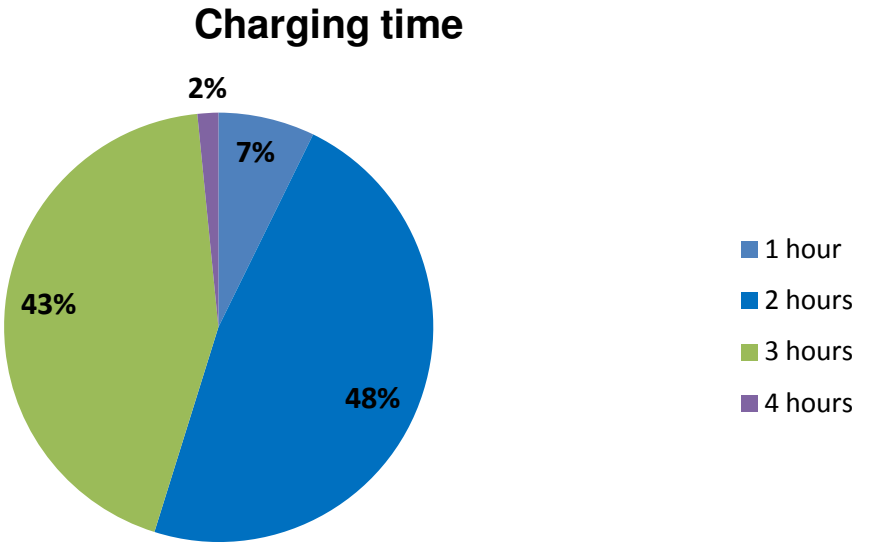
Mobile phones have been used to report incidences such as outbreaks of crop diseases affecting cotton crop (cotton is a popular business crop in Lake Zone region). It was also reported that mobile phones have been useful in electronic money transfer, the popular services in most places are through Airtel money and Vodacom M – Pesa.

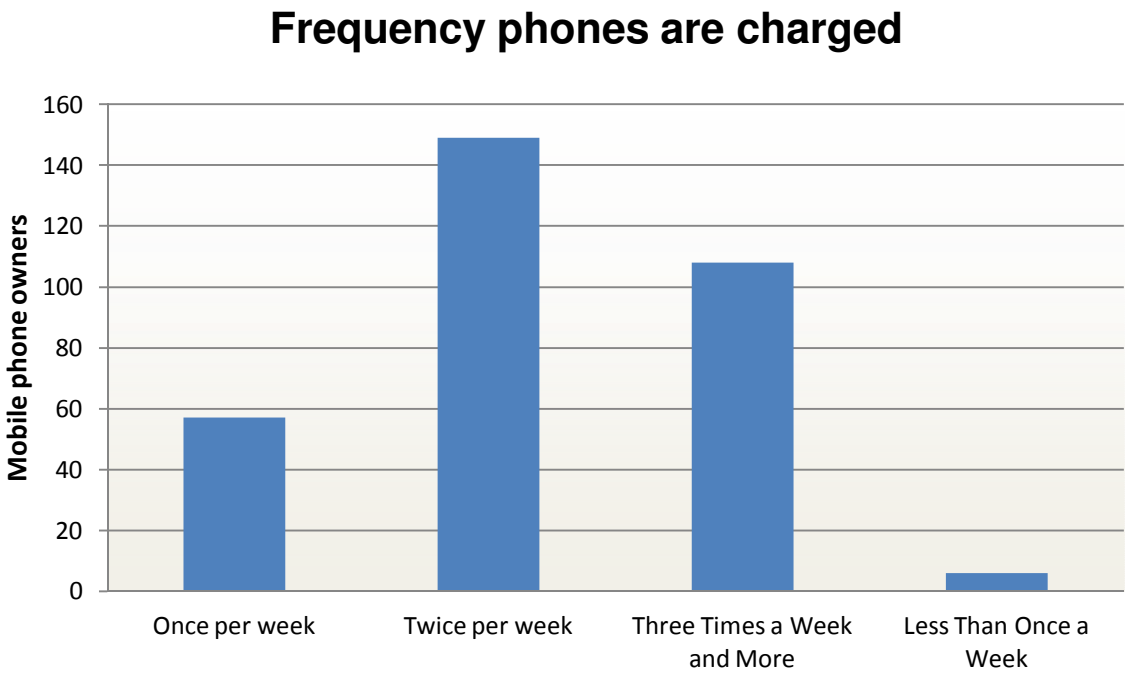
Findings from Busami indicated that mobile phones have been a good tool for reporting incidences to police forces and fire stations.



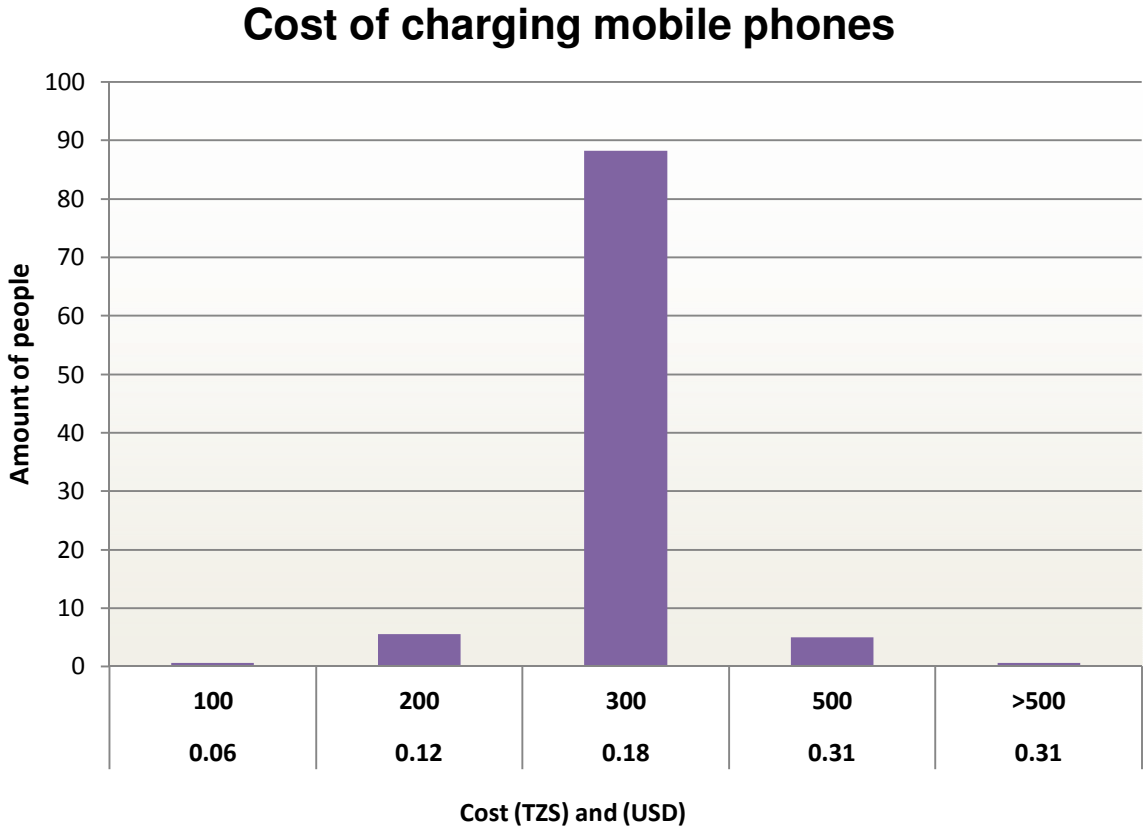

Sources of electricity
13%
30%
36%
13%
8%
Grid electrcity
Battery
Solar
Generator
None


Distance from households to charging locations
Frequency
160
140
120
100
80
60
40
20
0
0 to 0.5
0.51 to 1
1.1 to 2
2.1 to 4
4.1 to 18
Distance (km)


Charging time
2%
7%
43%
48%
1 hour
2 hours
3 hours
4 hours



Interviewees were asked if they would charge their phone more often if a charging service was closer by, 13% answered no while 87% answered yes.



Problems with Charging Phones	Number of Complaints
Loss of Phone Accessories	75
Service Not Available/Reliable	67
Long Queue	53
None	43
Phone Battery is Undercharged	34
Airtime Theft	19
Losing Phones	17
Poor Customer Service	16

Respondents were asked if they limited the usage of their mobile phone. Fifty-eight percent said that they did limit their usage. Out of the 58%; 54% said that they frequently turned off their phones while 46% said that they occasionally turned off their phone. By turning off their phones they are limiting the amount they can talk to customers and family members.

Mobile Phone Charging Businesses

This section shows information about the entrepreneurs and their businesses including the number of customers, their finances and what training they have received.

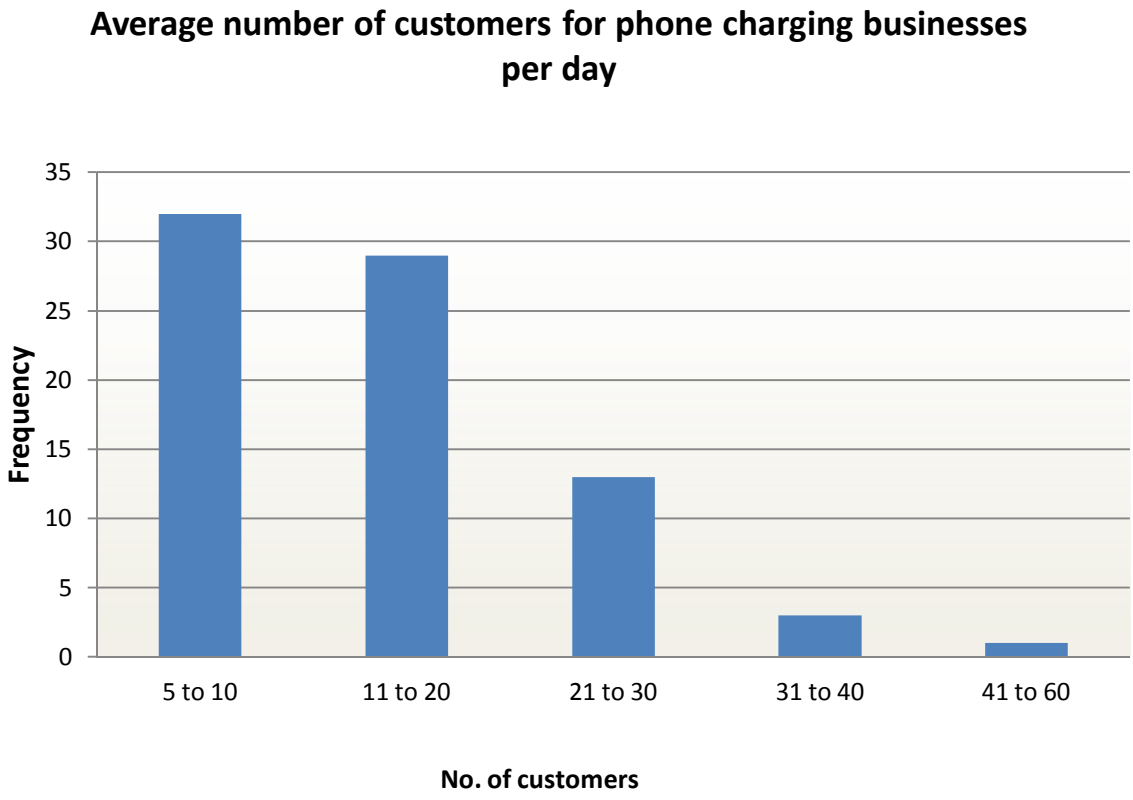
The sample had the follow characteristics:

- 64% males, 36% females
- 49% of the entrepreneurs have existing mobile phones businesses while 51% do not.

The research produced the following findings:

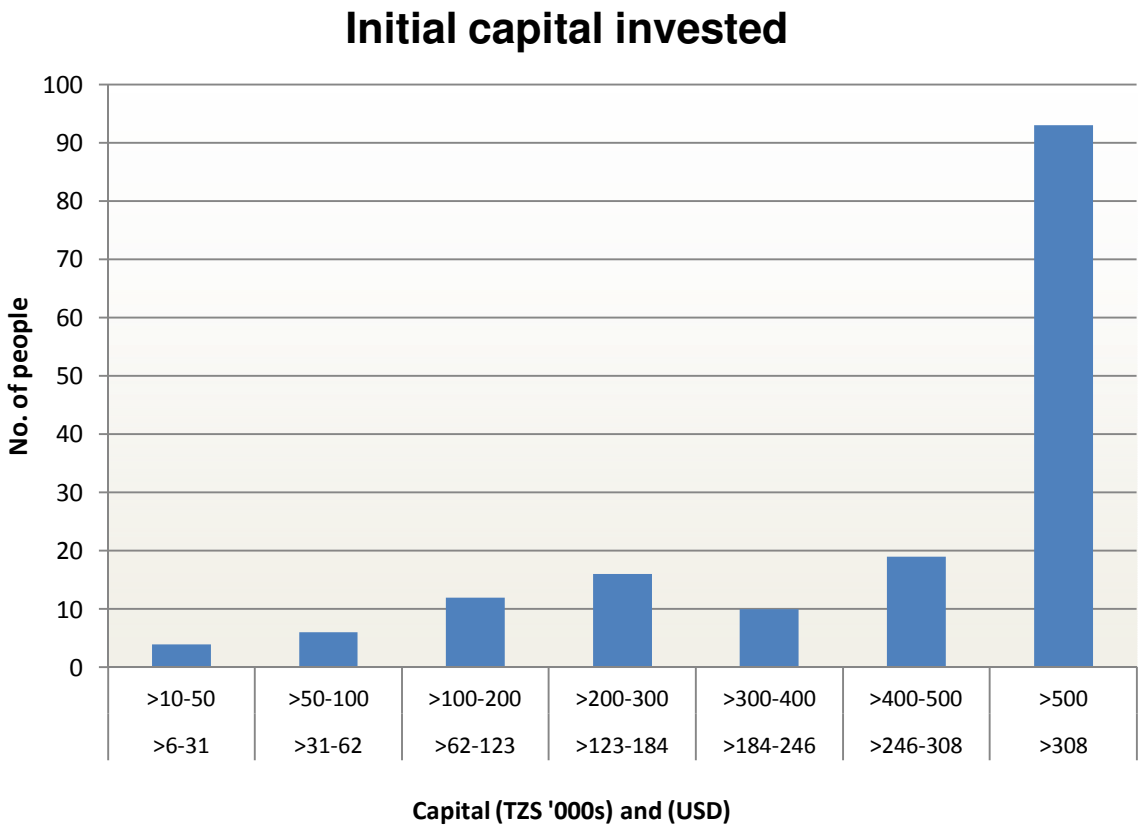
- Average number of customer a day was between 5 and 20
- The main motivation to start a mobile phone business was to increase profit
- The Initial capital invested in mobile phone businesses is usually above 500,000 TZS (308 USD)
- Average sales per day were between 1000-20000 TZS (USD 0.60-12.32)
- Profit per month was between 10,000-100,000 TZS (USD 6.16-61.61)
- The main training received was in entrepreneurship
- Entrepreneurs wanted to pay back loans in 25,000-50,000 TZS (USD 15.40-30.81) instalments
- The biggest problem with starting a mobile phone charging business was unreliable energy

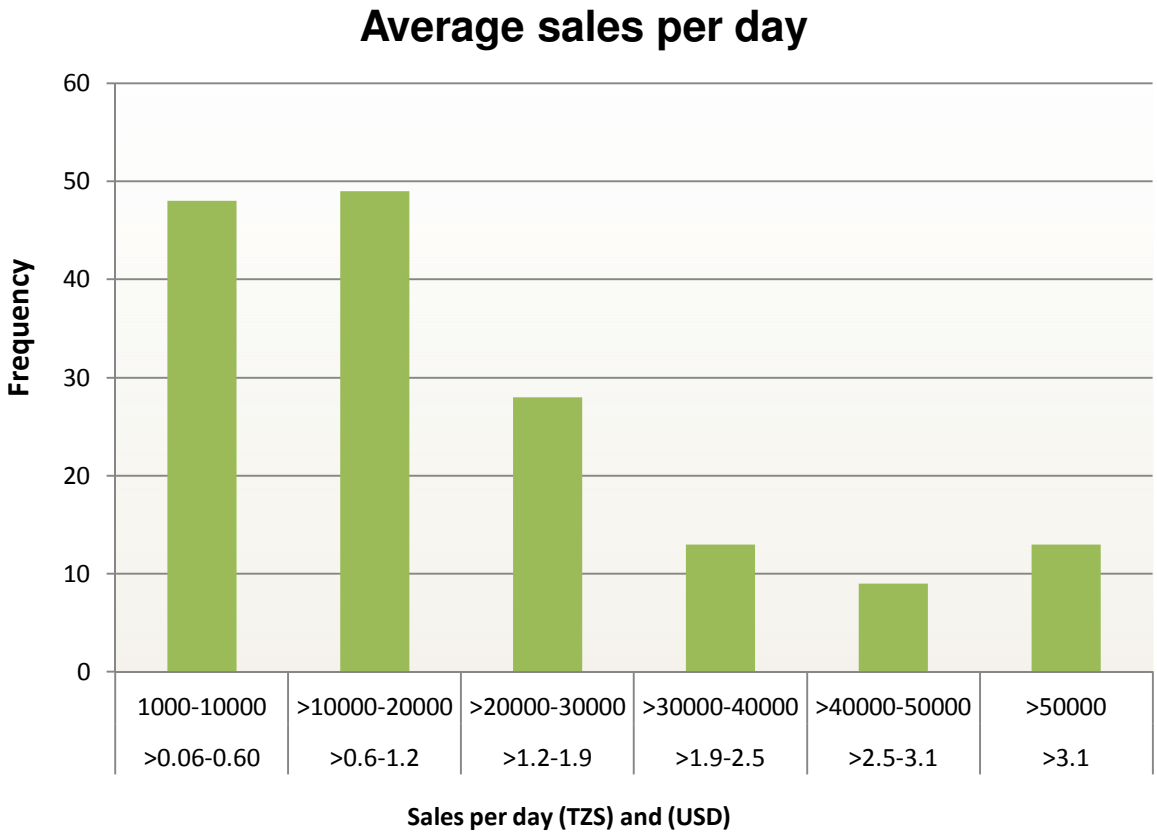
Business owners not currently offering phone charging services were asked if they were interested in starting a phone charging business, 75 of them said yes and 7 said no.

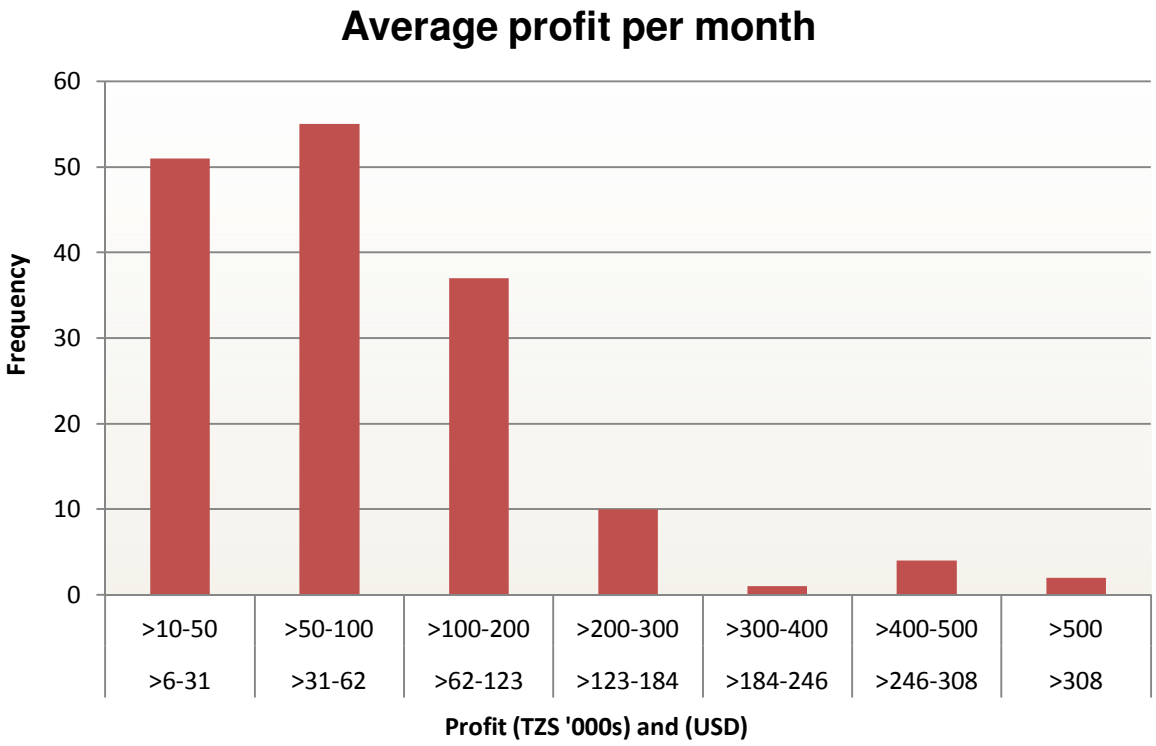


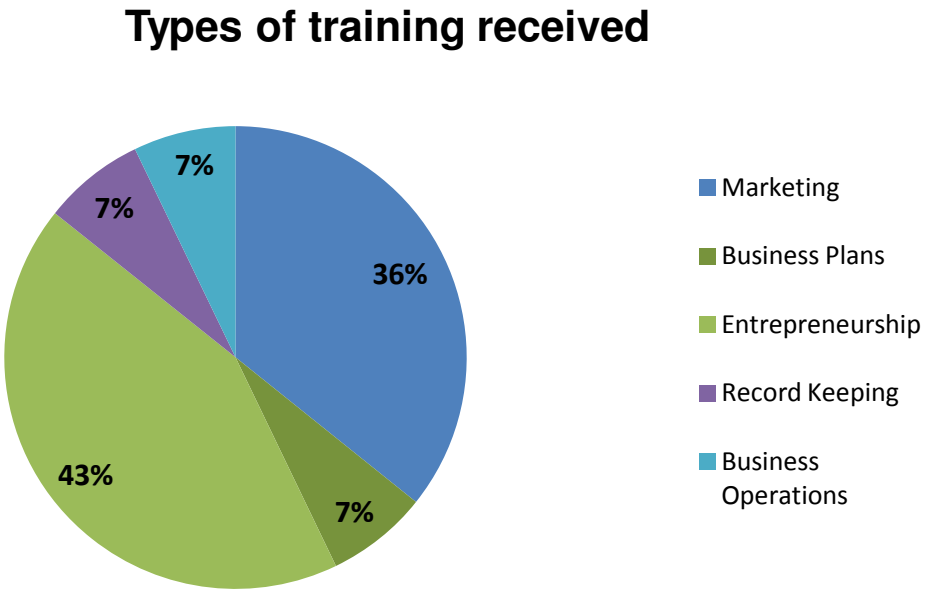
The number of customers of entrepreneurs providing mobile phone charging depended on the size of the enterprises in terms of space and charging equipment to accommodate customers.

Drivers to start a mobile phone charging business	No. Of Respondents
Generating more profit	60
Expanding the existing business	7
Other sources of income	3
High demand for phone charging services	6
New business opportunity	2

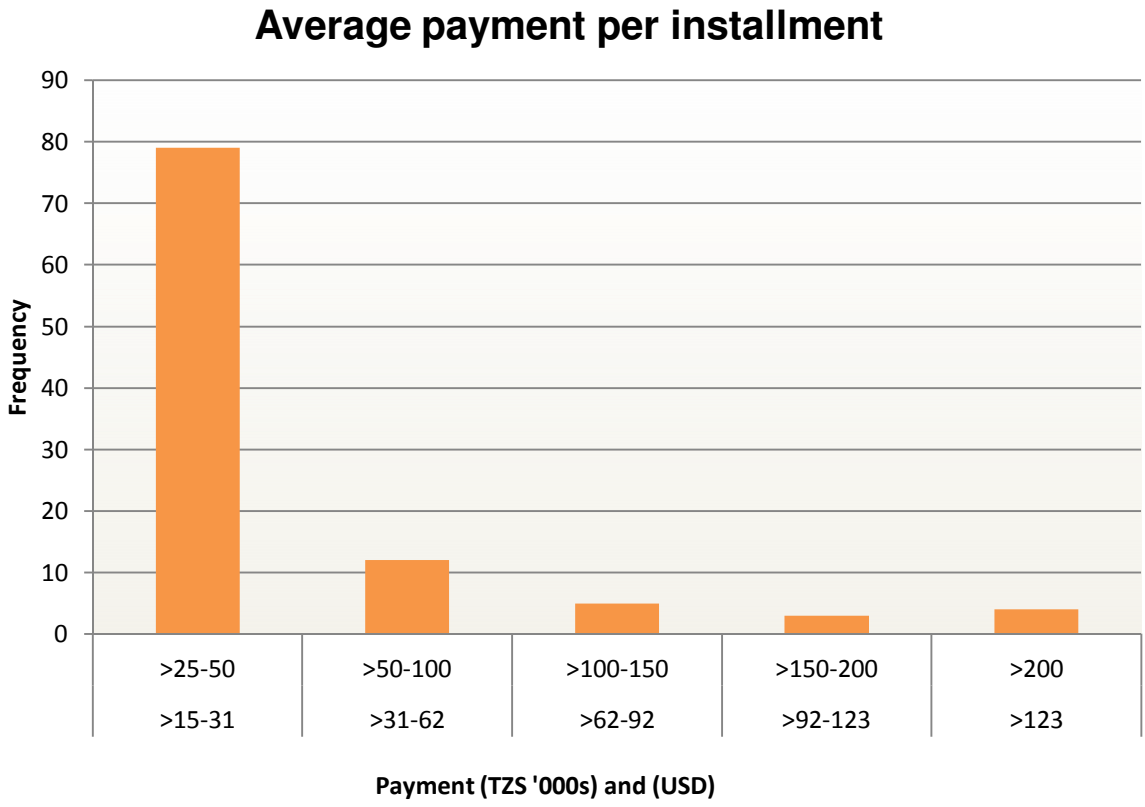

Initial capital invested
No. of people
100
90
80
70
60
50
40
30
20
10
0
>10-50
>6-31
>50-100
>31-62
>100-200
>62-123
>200-300
>123-184
>300-400
>184-246
>400-500
>246-308
>500
>308
Capital (TZS '000s) and (USD)


Average sales per day
Frequency
60
50
40
30
20
10
0
1000-10000
>0.06-0.60
>10000-20000
>0.6-1.2
>20000-30000
>1.2-1.9
>30000-40000
>1.9-2.5
>40000-50000
>2.5-3.1
>50000
>3.1
Sales per day (TZS) and (USD)





The business owners were also asked if they had received training. Ninety-one percent said they had not received training, 9% said they had received training. Those who answered yes to training were questioned about the types of training they had received. The most common response was entrepreneurship followed by marketing.



Business owners were asked if they would be more likely to buy phone charging equipment if they could pay in instalments. Fifty-seven people said full payment in cash would be better, 103 people said instalments would be better. From this they were then asked how large they wanted the instalments to be. The vast majority favoured payments of TZS 25-50,000 (USD 15.40-30.80) per month.

Problems with mobile phone charging businesses	Frequency
Unreliable energy	51
Shortage of equipment	14
High operating costs	11
None	2

Analysis of the Results for Selected Clusters

This sections show the breakdown of the results by geographic location.

Analysis of entrepreneurs per clusters

Variable		C. 1	C. 2	C. 3	C. 4	C. 5	C. 6	C. 7	C. 8
Gender	**Male**	65%	65%	70%	70%	60%	70%	60%	55%
	Female	35%	35%	30%	30%	40%	30%	40%	45%
Willingness to engage in phone charging business	**Yes**	100%	100%	100%	69%	80%	100%	83%	100%
	No	0%	0%	0%	31%	20%	0%	17%	0%
Tax payment	**Yes**	5%	45%	55%	10%	20%	40%	40%	45%
	No	95%	55%	45%	90%	80%	60%	60%	55%
Business training	**Yes**	5%	5%	10%	10%	0%	10%	20%	15%
	No	95%	95%	90%	90%	100%	90%	80%	85%
Payment system for charging equipment	**Full payment**	20%	45%	25%	20%	58%	45%	28%	55%
	Instalments	80%	55%	75%	80%	42%	55%	72%	45%

Note: *Cluster 1 - Magu, Cluster 2 - Bunda, Cluster 3 – Shinyanga, Cluster 4 – Kwimba, Cluster 5 – Bariadi, Cluster 6 – Mwanza, Cluster 7 –GeitaAnd Cluster 8 – Chato*

The gender balance was close to 50:50 at Chato cluster only. This indicates that there is low involvement of women in the selected clusters.

Results show that entrepreneurs had not received business training in almost all clusters. The majority of entrepreneurs prefer payments on instalment basis for purchase of charging equipment and accessories as observed in Magu, Bunda, Shinyanga, Kwimba, Mwanza and Geita clusters. Entrepreneurs' preference for full payments on the purchase of solar equipment and accessories were observed at Bariadi and Chato cluster only.

Conclusions

In conclusion this report shows that there is demand for mobile phone charging services in off-grid areas. One of the main reasons is the long distances that have to be travelled to access services currently (4-18 km).

Eight-seven percent of customers said they would charge their phone more often if they were closer to a charging station, enabling them to keep their phones on for longer periods during the day. Phone usage would be likely to increase as a result. Subscribers reported both economic (business, money transfer) and social benefits (family contact, security) resulting from phone ownership.

The research found that business owners are interested in starting new mobile phone charging services with 75 out of 82 respondents wanting to start a mobile phone charging business. Entrepreneurs could potentially improve their incomes by 31-62 USD a month which would increase their disposable income significantly.