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## Analysis of factors influencing information access among rural communities in Tanzania

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Information access in rural communities of Tanzania is very important as it keeps its members aware of what happened and what happening in the world. This importance can not be undermined since it helps farmers and other members of the rural community to make the right decision about their activities. Rural community areas are surrounded by many factors which in one way or another influence or hinder accessibility of information. Several works have been done on analysis of these factors; however most of them were conducted a number of years back. This study focused on providing the current survey on analysis of these factors. Specifically, the study analysed the following factors: source of power, penetration of mobile phones, subscription to networks, languages used and level of education, policy, government support, government administration and farming system. Mwanza District was used as a study area where descriptive research design was applied. Primary data were collected from farmers by using questionnaires while secondary data were collected from village reports and other research reports. The collected data were analysed by using Statistical Package for Social Science (SPSS). Findings show that in rural areas, there are unreliable source of power, higher penetrations of feature phones, high subscription to Vodacom network and high uses of Swahili language for communication, good government support and policy which favour farmer's development. Generally, we recommend that the existing sources of information like information systems and other applications should be integrated to form one stop centre where all information can be accessed.

**Key words:** Farmers, rural area, rural community, information access.

### INTRODUCTION

Information access in rural communities of Tanzania is very important as it keeps its members aware of what

happened and what happening in the world. This importance can not be undermined since it helps farmers

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and others members of the rural community in decision making and output improvement.

According to Bhagachand (2012) and Odini (2014), timely access to information helps farmers to make right decisions about their farming activities. Scholars (Bhagachand, 2012; Odera, 2016) advocate that farmers who have access to reliable information have higher chance of improving and increasing their products than those who have no access to information.

Study by Ronald et al. (2014) and Mtega (2012) realised that, rural area natives like farmers are not accessing sufficient information which could help them in decision making and yield improvement. There are a number of studies which focused on analysis of factors which influence information accessibility in rural community. However there is a little recent survey on analysis of these factors.

Rural community areas, which are defined by Hart et al. (2012) and Matasane and Zaaiman (2016) as areas that are located outside the towns, are surrounded by many factors which in one way or another influence or hinder accessibility of information. These factors include availability of electricity, lack of extension officers, penetration of mobile phones, policy and government support to mention just a few.

The presence or absence of these factors may hinder or support accessibility of information. For example, higher penetration of smart phones in rural area implies that there is a higher accessibility of information since rural people can surf online and get more information. Also, the presence of electricity supports uses of radio, TV and computer since more information can be accessed (Mtega, 2012).

There is a large body of work on analysis of these factors, but most of these works were conducted a number of years back. For example, the study by Karimuribo et al. (2016) in Kilosa and Gairo districts of Morogoro found that out of 138 livestock keepers, 133 (96.4%) had feature phones while 10 (7.2%) possessed smart phones.

A study by Ngowi et al. (2016) in rural community of Sengerema found that farmers own radios than mobile phones. A study conducted by Msyani (2013) and Isis (2012) on accessibility of electricity found that only 18.4% of the country's population has access to electricity. Authors added that the rural area of Tanzania is virtually disconnected from the National Electrical Grid (NEG) as 95% of rural people are using firewood.

Low penetration of smart phones and lack of electricity in rural communities as reported by aforementioned studies imply that in rural communities, there are difficulties in accessing information. Since there is a little current literature on analysis of these factors, this study provides

the current analysis.

## MATERIALS AND METHODS

### Study area

The study was conducted in Mwanga District, one of the seven districts of Kilimanjaro Region in Tanzania. The district lies between latitude 3°25" and 3°55" South of the equator and between longitudes 37°25" and 37°58" East of the Greenwich. The district has a total of 19 rural wards and one township ward (Mji Mdogo). The district also has a total of 72 Villages divided into 273 sub-villages. This study focused in 12 wards which are Jipe, Kwakoa, Kivisini, Lang'ata, Kileo, Kirya, Lembeni, Mgagao, Msangeni, Kilomeni, Mji mdogo, and Shighatini. Other wards of Mwanga district which were excluded from the study are Ngujini, Mwaniko, Kifula, Kirongwé, Chomvu, Kighare, Kigonigoni and Toloha. The district and its wards were chosen due to its significant number of farmers, its accessibility, budget available and location of the researcher.

### Research design, data sources and data collection

The study applied a descriptive research design which enabled the researcher to describe factors which surround farmers and influence information access in rural areas. Sources of secondary data were village reports and relevant research reports. Sources of primary data were farmers who live in rural areas and extension officers who provided the number of farmers for each ward. The targeted factors were those which fall under socio-economic, Information and communication technology (ICT) infrastructure, agriculture sector, technological factors, government support and policy. Survey and documentary review were used as methods for data collection. Data on government support, policy and farming systems were collected through reviewing village reports and other research documents. Questionnaires were used as tools for primary data collection. Questionnaire on farmers were sought to capture mentioned factors ready for analysis.

### Sampling procedure, sample size and data analysis

A total of 382 respondents were involved in the study whereby each ward was represented by 32 respondents, everyone with an attribute of being a farmer and has been involved in livestock keeping. The formula proposed by Kothari (2004) was used to find the sample size. This formula was selected due to fact that Mwanga District has a finite population. According to the Tanzania Population and Housing Census of 2012, Mwanga district has a total number of 115,145 people in which 79,126 are farmers. The sample size for this study was computed by using the formula below and a total sample of 382 farmers were used as representatives for the study.

$$n = \frac{Z^2 \cdot q \cdot p \cdot N}{e^2 (N - 1) + Z^2 \cdot p \cdot q}$$

Where by n = sample size

N= size of population  
 Z= is the score for confidence level 95% which is 1.96  
 p = sample proportion  
 e = Sampling error  
 q= 1-p, where q=0.5

$$n = \frac{Z^2 \cdot q \cdot p \cdot N}{e^2 (N - 1) + Z^2 \cdot p \cdot q}$$

Since farmers of Mwanga are 79,126, when we substitute in the above formula we get

$$n = \frac{(1.96)^2 \times 0.5 \times 0.5 \times 79,126}{(0.05)^2 (79,126 - 1) + (1.96)^2 \times 0.5 \times 0.5}$$

$$n = 382$$

Since the size of a sample is 382 respondents, then a maximum of 32 respondents for each of the 12 wards were selected as a representative sample. 32 respondents for each ward make a total of 384 respondents but only 382 questionnaire's responses were entered into Statistical Package for Social Science (SPSS) for analysis to determine descriptive statistics such as frequencies and percentages. We processed 382 questionnaires as responses received from 2 respondents were incomplete and meaningless.

## RESULTS AND DISCUSSION

### Penetration of mobile phones among farmers

The findings in Table 1 show that the penetration of feature phones in rural areas is greater than smart phones. It has been found that out of 382 respondents, 310 respondents (81.2%) own feature phones. Smart phones are owned by 72 respondents, equivalent to 18.8% of all respondents. This higher penetration of feature phone in rural area pose difficulties in information accessibility since rural community members can not use feature phones to surf online where more information can be available. Only 18.8% of all rural farmers have a chance to access extra information from internet.

### Mobile network subscription among farmers

The findings in Table 2 show that most farmers are subscribed to Vodacom network than other networks. Vodacom has 168 (44%) subscribers out of 382 interviewed respondents while Tigo has 152 (39.8%) subscribers. Airtel and Halotel subscribed by 11.8 and 4.5% of all farmers respectively. Presence of many networks in which rural communities peoples are subscribed reduces the chance of information

**Table 1.** Penetration of mobile phones in rural areas.

Types of mobile phone	Frequency	Percentage
Smart phone	72	18.8
Feature phone	310	81.2
Total	382	100.0

**Table 2.** Subscription of farmers among different networks.

Mobile networks	Frequency	Percentage
Vodacom	168	44.0
Tigo	152	39.8
Airtel	45	11.8
Halotel	17	4.5
Total	382	100.0

accessibility since every customer can access information from network in which he/she subscribed. For example, if Halotel network provides information via Unstructured Supplementary Service Data (USSD) application, this means that those who are subscribed in other networks will not be able to access that information unless they subscribe to responsible networks.

### Source of power for farmers

Farmers in rural areas are surrounded by the problem of source of power. Most farmers are living in houses which are not connected with electrical power. Findings show that, 186 (48.7%) out of 382 farmers had no electric power in their houses. Tanzania Electric Supply Company (TANESCO) had connected electricity to 32.7% of all interviewed farmers while 18.6% use solar energy as a source of power in their houses. The presence of electrical power in houses encourages uses of sources of information like computer, radio, television and mobile phones hence supports accessibility of information in general. Table 3 shows penetration of different source of power to farmers in rural areas (Table 3).

### Levels of education of respondents

Primary education is the dominant level of education in most rural areas. More than half of all interviewed farmers had primary education. Findings show that out of

**Table 3.** Source of power to farmers.

Source of power	Frequency	Percentage
TANESCO	125	32.7
Solar	71	18.6
No power	186	48.7
Total	382	100.0

**Table 4.** Levels of education of respondents.

Levels of education of respondents	Frequency	Percentage
Primary education	220	57.6
Ordinary secondary education	108	28.3
Certificate	50	13.1
Advanced secondary education	4	1.0
Total	382	100.0

**Table 5.** Language used by farmers.

Languages used by farmers	Frequency	Percentage
English	30	7.9
Swahili	331	86.6
Both (English and Swahili)	15	3.9
Other language	6	1.6
Total	382	100.0

382 farmers, 220 farmers (57.6%) had only primary education. Farmers who had ordinary secondary education were 108 (28.3%) of all farmers. Certificate holders and those with advanced secondary education made a total percentage of 14.1% which are 13.1 and 1% respectively. There were no farmers who are degree holders and above. Primary education is the basic education level, but it is not sufficient to enable farmers to search and digest information in a wide view compared to degree holders. So, to some extent this level hinders accessibility of information. Table 4 represents summaries of education level of respondents.

#### Language of communication among farmers

Almost all farmers are able to use Swahili language for communication. Few farmers who are found in very remote area are using local language for communication. Table 5 shows languages which are used by farmers in communication. It had been found out that 86.6% of all

farmers are able to communicate by using Swahili language only. 3.9% uses both Swahili and English while 7.95% of all farmers are able to communicate by using English. Those who communicate by using local languages like Kipare and Kigweno make 1.6% of all farmers. High uses of Swahili language influence the flow and accessibility of information since farmers can clearly understand extension officers. The problem rises when they need extra information from internet where English language is dominant.

#### Policy, government support and administration

The government of Tanzania supports development and encourages investment in Agriculture especially in the Livestock Sector. One of the supports in livestock sector is that of 2006.

In this year, the government approved a National Livestock Policy (NLP) based on the premise that "the Livestock Industry has an important role to play in

building a strong national economy and in the process, reducing inequalities among Tanzanians by increasing their incomes and employment opportunities” (URT, 2006). The NLP also realizes that apart from contributing to gross domestic product (GDP), the livestock sector has a role to play in: providing employment to households, providing draught power, food security and fulfilling cultural roles. A policy which does not support agriculture may hold back initiatives to faster accessibility of information in rural areas.

Another government support and administration towards supporting livestock sector is that of 2010. In this year, the Ministry of Livestock Development and Fisheries formulated a Livestock Sector Development Strategy (LSDS) for operating the NLP of 2006. The LSDS is working as an operation tool for the NLP. It is the one which is responsible for spelling out the actionable interventions required to meet the livestock sector Vision, Mission and Objectives in short, medium and long term.

Also, the government designed Livestock Sector Development Programme (LSDP) to implement NLP of 2006 and LSDS of 2009 in the context of Kilimo kwanza, Rural Development Strategy (RDS), National Strategy for Growth and Reduction of Poverty (NSGRP), Comprehensive Africa Agriculture Development Programme (CAADP) and Tanzania Development Vision 2025 (URT, 2011). Since the existing policy, government support and government administration are in favour of agriculture development, then this environment influences the flow and accessibility of information.

### **Existing farming systems and extension officers**

The study looked into the existing farming system in rural areas to see if it interfere with any information accessibility. The findings show that there are three main types of farming systems which operate in rural areas of Tanzania and it does not interfere with any information accessibility. These systems are arable farming, pastoral farming and mixed farming. Under arable farming, farmers are growing crops only. Farming systems like dairy farming, raising sheep for wool and raising beef cattle are falling under pastoral farming. Mixed farming systems practice both arable and pastoral systems (Descheemaeker et al., 2010). From 2014, the Government of Tanzania under the ministry of Livestock and Fisheries Development had managed to distribute two extension officers per ward. This was observed in Mwanga district where by each ward have two officers, one for livestock and the other for crops. However, comparing to the number of farmers and their locations, two extension officers are too few to serve the entire

ward. This is to say that, there is a problem of insufficient number of extension officers in rural areas of Tanzania. This hinders the rural community to access information since the number of extension officers is few compared to members of the rural community.

### **Conclusion**

Information access in rural communities of Tanzania is very important as it keep its members aware of what happened and what happening in the world. This importance cannot be undermined since it helps farmers and others members in decision making and output improvement. But the rural areas of Tanzania are surrounded by many factors which in one way or another influence or hinder accessibility of information.

Examples of these factors are policy, socio-economic factors and ICT infrastructure to mention just a few. However, there is a little recent survey on the analysis of these factors. This study was focused on providing the current survey on analysis of factors which influence information access among rural communities in Tanzania. Specifically, the study analysed the following factors: source of power, penetration of mobile phones, subscription to different networks, languages used and level of education. Other factors were policy, government support, government administration and farming system. Mwanga District was used as a study area where descriptive research design was applied. Primary data were collected from farmers by using questionnaires while secondary data were collected from village reports and other relevant research reports. The collected data were analysed by using SPSS.

Findings show that in rural areas there are unreliable source of power, higher penetrations of feature phones, high subscription to Vodacom Network and high uses of Swahili Language for communication. Also, primary education is the highest level reached by many farmers. For the side of government, there is a government support and policy which favour farmer's development. The government had approved a good policy which recognizes and encourages livestock development. The dominant farming systems are pastoral, arable and mixed farming.

Based on the findings, it shows that still there is a challenge in information accessibility in rural areas. However, each challenge provides an alternative way for a way forward to improve its accessibility. For example, higher penetration of feature phones implies low accessibility of information since owner of feature phones can not browse on internet to get more information. But accessibility of information can be improved by

introducing many USSD applications or integrating it since its information can be easily accessed via feature phone.

## RECOMMENDATION

Based on the findings obtained and discussion made, we recommend the following things for the better improvement of information accessibility in rural communities of Tanzania:

1. Since there is higher penetration of feature phones in rural areas of Tanzania, then those who want to improve accessibility of information in those areas through application of technologies should do so by introducing technology which is practicable in feature phones. This is to ensure that, the introduced technology helps more than 80% of all farmers as our findings show.
2. Subscription of many community members to Vodacom Network implies that these members can be reached easily via the same network. In case we want to enhance accessibility of information to these farmers via applications like USSD, its server should be hosted at the Vodacom Network to enable many farmers and other members to access information it disseminate.
3. Lack of electricity in rural areas of Tanzania hinders maximum utilization of sources of information like system applications, internets, radio and mobile phones especially smart phones which consume more power than feature phones. So more information should be directed via sources which do not consume or consume less power.

Generally, we recommend that the existing sources of information like information systems and other applications should be integrated to form one stop centre where all information can be accessed. This will enable members of rural areas who most of them are farmers to access information on time. The study on finding ways of integrating the existing sources of information to form one stop centre is open for future work.

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## CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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