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Role of Information and Communication Technologies in Sustainable Livelihoods in Selected Rural Areas of Tanzania

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Abstract

In the recent past, Information and Communication Technologies (ICTs) have been accorded significant importance in development and poverty reduction. This article reports findings and conclusions of a study that used the sustainable livelihoods framework to investigate the link between ICTs and rural livelihoods in four rural districts in Tanzania. The study, which used a multi-case study research design, found out that, while ICTs may not fully support and sustain socio-economic development in poor countries, the impact of these technologies extends to various aspects of the livelihoods of the rural people. Economically, these technologies lead to better earnings and savings. Socially, they help in community interaction and knowledge sharing, and enable improved follow up for remittances and the creation of savings and credit cooperative societies. In relation to human capital, the impact extends to ICTs literacy, improved farming techniques and better access to information on new cash crops. The study concludes that increased access to ICTs may give people in the rural area access to more livelihoods resources and assets, and recommends that barriers to ICTs access such as illiteracy, lack of electricity and ICTs affordability be addressed.

Keywords

Sustainable livelihoods framework, information and communication technologies, rural development, Tanzania

Introduction

Telecentres have been characterised as public facilities in the community that afford people the opportunity to use computers, networks, photocopiers, scanners, telephone, printed materials, and audio and video resources for information searching, communication, training and entertainment. In many developing countries, telecentres have become like a hub for rural connectivity; and in many rural areas, telecentres are the only places that provide Internet services, computer training and other ICT related services to the public. In Tanzania, most telecentres are donor funded projects operated jointly by donors (in some cases more than one donor) and the Tanzanian Government represented by the Tanzania Commission for Science and Technology (COSTECH) and the Tanzania Communications Regulatory Authority (TCRA) at the national level. At the community level, there is also a local organising committee which in most cases is embedded within the local government structures at the district level. The services provided in telecentres are either free or available at an affordable cost.

In Tanzania and in many other African countries, mobile phone services have also experienced phenomenal growth in recent years, and cellular telephone is described as an 'ICT' that is bridging the digital divide in Africa and is considered the most significant entry point to the information society for Africans (Heeks, 1999). For these reasons, this study refers mainly to these services when investigating the link between ICTs and livelihoods of the people leaving in rural areas. It is in this context that this study investigates the link between ICTs and rural livelihoods in selected rural areas of Tanzania. The investigation uses the concept of sustainable livelihoods with an asset/vulnerability approach (Chambers and Conway, 1992; DFID, 2001) as a lens through which to assess the contribution to livelihood sustainability made by ICT services. Mobile phone services and ICTs services provided by telecentres located in four rural districts in Tanzania form the basis of the investigation.

Rural areas of Tanzania exhibit interesting characteristics which make the areas relevant for carrying out this kind of study. Seventy per cent of the Tanzanian population lives in rural areas where agriculture, in the form of smallholder producers, is the major economic activity (United Republic of Tanzania, 2005). However, in most rural areas, small scale activities of other sectors such as livestock keeping, business, handicrafts, fishing, arts and cultural activities are also common. Most of these economic activities are underdeveloped, and poverty levels are still high in most rural areas of Tanzania (United Republic of Tanzania, 2005).

Sustainable Livelihoods Framework

The sustainable livelihoods approach is widely used in the field of development, and increasingly, in the context of ICT based development initiatives (Arun, Heeks and Morgan, 2004; Soriano, 2007; Souter *et al*, 2005). In addition, Heeks (1999) pointed out that as ICTs continue to diffuse and as greater attempts are made to apply them to current poverty-focused agenda goals, there are increasing opportunities for livelihoods frameworks and tools to make a contribution to understanding the linkages between ICTs and development.

Furthermore, Gerster (2006) emphasised that application of the livelihoods approach in poverty reduction initiatives using ICTs is of paramount importance because the role of ICTs in poverty reduction is not only limited to reducing income poverty, but also helps to address non-economic challenges such as empowerment, unequal access to land, credit, and services (for example health and education), vulnerability (towards violence, external economic shocks, natural disasters), powerlessness and social exclusion. The use of sustainable livelihoods framework is also useful in this study because bridging the rural-urban digital divide is not merely about increasing the number of telephone lines or providing improved Internet access, but is basically about impacting the lives of people and empowering them through ICTs (Singh, 2006).

The sustainable livelihoods framework is an approach to development and poverty reduction which has evolved from changing perspectives on poverty, participation and sustainable development (Chambers and Conway, 1992; DFID, 2001). Criticisms of narrow indicators of poverty that are confined to income alone led to interest in livelihoods approach which is based on a holistic perspective to understanding poverty (Moser, 1998). The livelihoods approach focuses on sustainable local-level poverty reduction strategies which strengthen people's own innovative solutions. According to Chambers and Conway (1992), a livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks, and maintains or enhances its capabilities and assets both now and in the future, while not undermining the natural resource base.

A sustainable livelihoods framework based on the DFID (2001) approach (Figure 1) includes the following major principles: vulnerability context, capital assets, processes and livelihoods outcomes that are all related to poor livelihoods. The sustainable livelihoods framework identifies five types of assets or capital upon which livelihoods are built. Increasing access (ownership or rights to use) to these assets can make a central contribution

to poverty reduction. The various components of the sustainable livelihoods framework are as discussed below.

Vulnerability context: The vulnerability context is the starting point of the sustainable livelihoods framework. The lives of the poor people are strongly affected by factors that make them and their assets vulnerable. Some of these factors include trends such as population change, national and international economic trends; shocks such as natural disasters, epidemics, civil conflict and economic crises; seasonality variations in prices, costs, production, food supply and economic opportunity.

Capital assets: These assets include the following:

- *Human capital* represents the skills, knowledge, ability to labour and good health that together enable people to pursue different livelihood strategies and achieve their livelihood objectives.
- *Social capital* is the genre of social resources upon which people draw in pursuit of their livelihood objectives. It includes networks, participation in social or productive groups and mutually-beneficial relationships.
- *Natural capital* is the term used for the natural resource stocks from which resource flows and services useful for livelihoods are derived.
- *Physical capital* comprises the basic infrastructure and producer goods needed to support livelihoods.
- *Financial capital* denotes the financial resources that people use to achieve their livelihoods such as available stocks, which can be held in several forms such as cash, bank deposits, liquid assets such as livestock and jewellery, or resources obtained through credit-providing institutions and regular inflows of money, including earned income, pensions, other transfers from the state and remittances.

Transforming structures and processes: These include institutions, organisations and policies which are crucial in shaping livelihoods. They operate at all levels, from the household to the international arena, and in all spheres, from the most private to the public.

Livelihood outcomes: Livelihood outcomes are the achievements or outputs of livelihood strategies. They could include outcomes such as higher income levels, an increased sense of well-being, reduced vulnerability, improved food security, and more sustainable use of natural resource base. Livelihoods outcomes are sustainable when they are resilient in the face of external shocks and stresses.

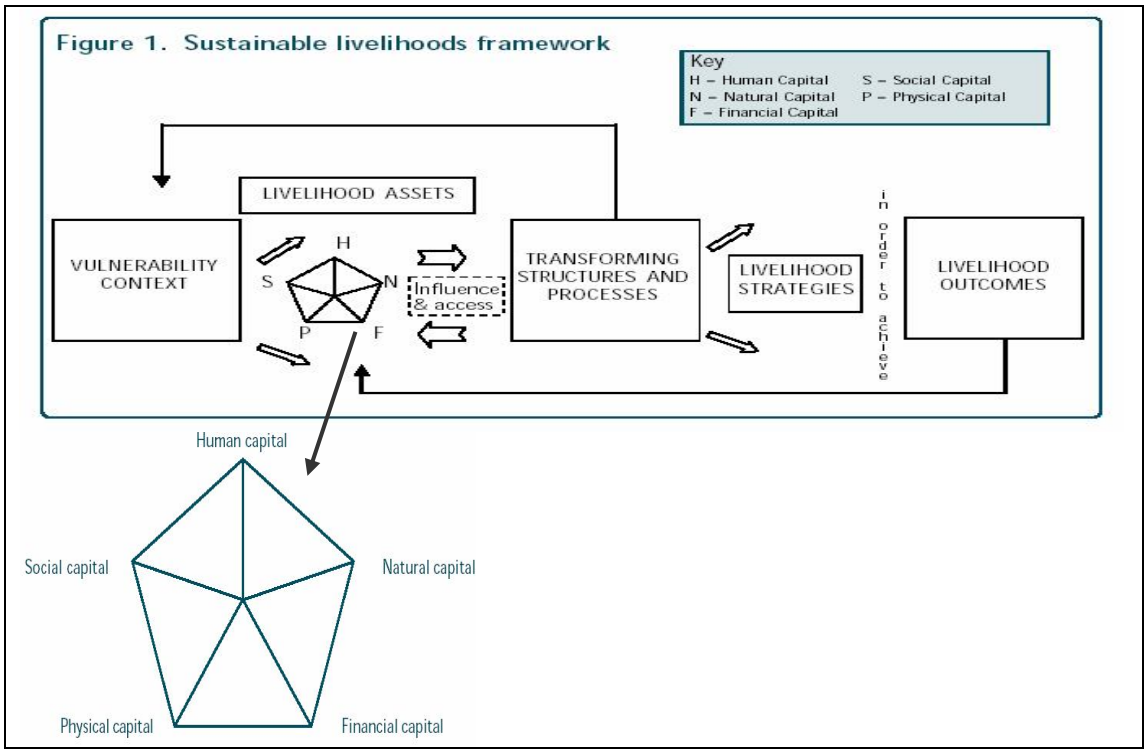

Figure 1: The sustainable livelihoods framework (DFID, 2001)

Methodology

The study was conducted in four rural districts located in two regions in the North-West of Tanzania. The districts are Ngara, Karagwe, Magu and Sengerema, and the study was conducted in the district headquarters. Ngara and Karagwe are two of the five districts in Kagera region, which is situated in the extreme north west of Tanzania. The region borders Rwanda to the North and Burundi to the Southwest, and lies more than 1,500 kilometres from Dar es Salaam, the capital city of Tanzania. Magu and Sengerema are two of the seven districts of the Mwanza region located in the North-Western part of Tanzania bordering Lake Victoria.

The four districts do not fall directly under the Tanzanian political and administrative definition of rural areas; however, in terms of ICT infrastructure development, all these areas are considered rural and they comply with the International Telecommunication Union [ITU] (2000) definition of rural and remote areas. According to ITU (2000), a rural area is characterised by absence of public facilities such as reliable electricity supply and regular transport, scarcity of technical personnel, low level of economic activity mainly based on agriculture, fishing or handicrafts, low per capita income and underdeveloped social infrastructures such as health and education. These characteristics are common to the four selected study areas. Besides, the areas face the challenge of bringing sustainable ICT solutions to remote areas poorly served with basic infrastructure such as transport, electricity and communication infrastructures. Therefore, the term 'rural' as it used in this study is more associated with remote and disadvantaged regions rather than the size of the town. Furthermore, according to Nielinger (2003), district headquarters reflects the status quo of Tanzanian upcountry ICT deployment that had started from the centre in Dar es Salaam and subsequently included major regional towns, and is now about to target the district level, which is the focal point of this research. Nevertheless, during the time of the study, all the four districts had community telecentres. Sengerema and Ngara also had community radio stations, while Ngara was in the final process of launching two different community radio stations.

The study was conducted using multi-case study research design with a combination of qualitative and quantitative methods of data collection. A case study is defined as an empirical enquiry that investigates a contemporary phenomenon within its real life context, especially when the boundaries between phenomenon and context are not clearly evident and in which multiple sources of evidence are used (Yin, 1994, 2004). It is a method used to study a social phenomenon through a thorough analysis of an individual case which may be a person, group, community, society, or any other unit of social life (Leedy and Ormrod, 2001). Yin (2004) and Leedy and Ormrod (2001) also pointed out that case study research can include a single or multiple cases, while Yin (1994) sees evidence gathered from multiple case studies as being "more robust" and provides stronger basis for generalization than single case study.

In the study, telecentres and the communities surrounding them were considered to be the cases in focus, and households in the wards surrounding the telecentres in the four districts were considered to be the population of study. Sampling of households was done using non-proportional quota sampling method. Economic activities such as farming, livestock keeping, small scale business and fishing formed the strata from which the quotas of respondent households were chosen. Perceived adequate sample sizes were obtained in each of the communities. On the basis of these sampling techniques, the numbers of respondents sampled from the four communities as shown in the table 1.

Table 1: Districts, wards, telecentres and respondents involved in the study

District	Population of district*	Ward	Number of households around telecentre	Telecentre involved	Number of respondents
Sengerema	498,993	Sengerema	180	Sengerema Multi- Purpose Community Telecentre	53
Magu	415,005	Magu and Lubugu	250	Crop and Marketing Bureau (CROMABU) Telecentre[1]	60
Karagwe	424,287	Kayanga	100	Family Alliance for Development Cooperation (FADECO) Telecentre[1]	40
Ngara	334,409	Ngara	200	Ngara Multi- Purpose Community Telecentre	50
				Total	**203**

Note: Crop and Marketing Bureau (CROMABU) Telecentre was studied in the district of Magu while Family Alliance for Development Cooperation (FADECO) Telecentre was studied in Karagwe.

* *Source:* United Republic of Tanzania (2011).

Various data collection methods were employed in this study. These include semi-structured interviews which were conducted with representatives of the sampled households. Focus group discussions (FGDs) were also conducted with respondents sampled from the same communities. The participants in the FGDs were additional to the interview respondents listed in Table 1. There were between 8 and 12 participants in the FGDs, as advised in the literature (Mosia and Ngulube, 2005). Two FGDs were conducted in each community, for a total of eight FGDs in the entire study. A semi-structured interview protocol and a focus group discussion guide were used as data collection instruments.

The SPSS® Version 15 was used to analyse the quantitative data from closed ended questions in the semi-structured interview protocol, whereas the Nvivo 8 software was used for analysing the qualitative data from the focus group discussions and the open ended responses in the semi-structured interviews. The Nvivo software was used for coding, analysing and organising qualitative data into themes, and the identified themes were used in the interpretation and discussion of the results of the study.

Results and Discussion

This section discusses the components of the sustainable livelihoods framework and the impact of the ICTs on these components based on the results of this study. However, before going to the actual discussion on the link between ICTs and rural livelihoods, an overview of access and use of ICTs in the research areas is presented so as to help the reader understand the context under which this study was conducted.

Access and Use of Available ICT Services in the Communities

ICTs services involved in this study were two folds. These include ICT services provided by telecentres, and telephone services which were mainly mobile phone services. Various services were offered by the telecentres involved in this study. These include Internet services (including e-mail and web browsing), computer training, community radio services, and agriculture marketing information services. None of the telecentres was offering telephone services directly. Some had public phones fitted in their premises (Sengerema and CROMABU), but these were rarely used. Both users and non-users of these services were interviewed as shown in Figure 2.

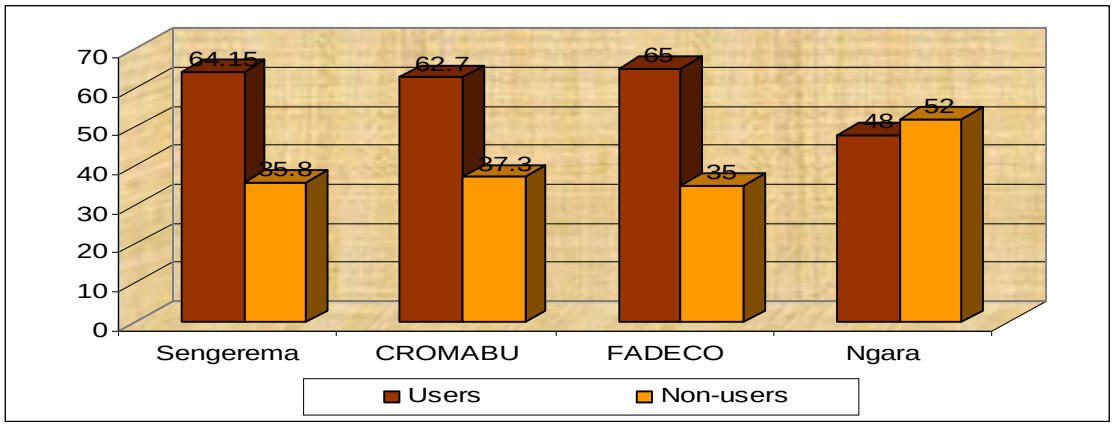

Figure 2: Users and non-users of the telecentre services

The use of telephone services in these communities as indicated by the respondents was dominated by mobile phones. Results show that mobile phone was the most used type of telephone (93%), with fixed line phones accounting for a mere 2% and households with no access accounting for the rest, as shown in Figure 3. Furthermore, most people had access to the mobile phone devices through ownership (66%), borrowing (26%) and public phones (3%).

ICTs and the Vulnerability Context

The sustainable livelihoods framework views people as operating in a context of vulnerability. Within this context, they have access to certain assets or poverty reducing factors. In addition, the vulnerability context influences the livelihood strategies or the various ways of combining and using assets that are open to people in pursuit of beneficial livelihood outcomes that meet their livelihood objectives (DFID, 2001).

In the sustainable livelihoods framework, the vulnerability context frames the external environment in which people exist (Devereux, 2001). People's livelihoods and their assets are fundamentally affected by trends or shocks emanating from government, politics, technology, economic trends, conflicts, natural disasters, and epidemics. Furthermore, the lives of poor people are also affected by seasonal variations in prices, production and economic opportunities. The vulnerability context gains importance through direct impacts

upon people's asset status (Devereux, 2001). In most cases, poor people have limited or no control on these trends, shocks and seasonalities. The vulnerability context can have direct impact upon people's asset status and the options that are open to them in pursuit of beneficial livelihood outcomes. However, not all trends and seasonality must be considered as negative; they can move in favourable directions too. Trends in new technologies or seasonality of prices could be used as opportunities to secure livelihoods.

DFID (2001) pointed out that the different components of the vulnerability context affect different people in different ways. For instance, changes in international commodity prices would affect those who grow, process or export such commodities, but would have little direct effect on those who produce for or trade in the local market. ICT can help poor people by making their assets to become less vulnerable to shock, trends and seasonality through providing access to timely, relevant and adequate information. Gerster and Zimmermann (2003) pointed out that information can prevent poor people from exposure to risks and, in case of disasters, also help to get aid to them more efficiently.

In this study, the communities involved in the study were analysed in relation to their vulnerability context. It was found out that the major sources of vulnerability were remoteness, family related shocks such as injury or death of a close relative, high unemployment, severe weather conditions such as excessive drought or flooding and seasonal variation in the prices and availability of food stuff. In addition, the community was found to be vulnerable to fluctuating global commodity prices of their traditional cash crops such as cotton and coffee.

Concerning the impact of ICTs on the vulnerability context, respondents acknowledged the beneficial impact of the mobile phones in the ability to deal with family emergencies such as health issues, injury and death of a close relative. Mobile phones were also found to be beneficial in calling for help in cases of emergency. For instance, mobile phones were used to call for a taxi or a person with a bicycle in the event that someone became sick and needed to be taken to the hospital. These are some of the things that a few years ago people living in the rural areas could not do.

Therefore, ICTs, and in this case the mobile phones, were helping these people to be less vulnerable to family emergencies and shocks. The mobile phones were providing them with an opportunity to get help from places beyond their immediate community. Friends and relatives in distant places could thereby respond and offer help where needed. Similar results had been reported by Souter *et al,* (2005) where a mobile phone was reported as the most important channel for emergency information and communications between family members. The mobile phone is helping these people overcome remoteness and access social capital even from relatives living far away. The study by Souter *et al,* (2005) pointed out that much of the vulnerability that people face comes from lack of knowledge or information. Farmers have often been vulnerable to the market power of intermediaries and large companies due to lack of information

Nevertheless, information provided by ICTs may not mitigate all the vulnerabilities that rural communities are facing. For instance, it is unlikely that ICTs may affect the fluctuating global commodity prices of their traditional cash crops such as cotton and coffee. However, the technologies are providing people with information that helps them diversify their sources of income.

The Assets Pentagon

The livelihoods framework explains further that within the vulnerability context explained above, people deploy five types of livelihood assets or capital (represented by the asset pentagon shown in Figure 1). People's lives are built upon these core asset categories or types of capital. Increasing access (ownership or rights to use) can make a central contribution to poverty reduction (DFID, 2001).

The assets include social capital, natural capital, financial capital, physical capital and natural capital. These assets are deployed in various combinations within circumstances influenced by institutional structures and processes in order to pursue diverse livelihood

strategies with more or less measurable 'livelihood outcomes'. Devereux (2001) pointed out that the capital assets represent peoples' strength and it's crucial to analyse their endeavours to convert their assets into positive livelihood outcomes. This study assessed the impact of ICT in three of the five capital assets, i.e., human capital, social capital and financial capital.

ICTs and Human Capital

Human capital represents skills, knowledge, ability to labour and good health that together enable people to pursue different livelihood strategies and achieve their livelihood objectives (DFID, 2000). At the household level, it varies according to household size, skill levels, leadership potential, health status, etc. and appears to be a decisive factor– besides being intrinsically valuable – in order to make use of any other type of assets. Therefore, changes in human capital have to be seen not only as isolated effects, but as a supportive factor for the other assets.

The result of this study shows that ICTs such as Internet, community radio and mobile phones have made some positive contribution to the human capital. However, the use of Internet and mobile phones for knowledge acquisition which is the primary component of the human capital was not very common. Similar results were also reported by Souter *et al*, (2005), which reported that the telephone was having no impact on information-gathering and that face-to-face communication remains the overwhelmingly dominant medium of communications for information-gathering. Souter *et al* (2005) further reported that Internet use was low and failed to achieve any significant degree of usage in knowledge acquisition.

Online access to the examination results of secondary school students delivered by the National Examination Council of Tanzania (NECTA) was one of the services widely used in all the telecentres. Mlaki (2007) pointed out that the application of ICTs in the processing and delivery of the examination results in Tanzania led to faster processing and early release of the results which in turn enabled candidates to join colleges without delay. Mlaki (2007) further suggested that more online transactions needed to be implemented such as e-ordering of results slips, e-registration of candidates and adoption of SMS services. The online delivery of the examinations results positively impacted on the human capital in the rural areas, as it gave people an opportunity to access education services and opportunities faster and at a low cost.

ICTs and Social Capital

In the context of the sustainable livelihoods framework, social capital represents social resources upon which people draw in seeking for their livelihood outcomes. These include networks and connectedness that increase people's trust and ability to cooperate. It also includes membership in more formalised groups and their systems of rules, norms and sanctions. The result of this study shows that social communication was the main reason as to why people were using ICTs. E-mail was mainly used for social communication with friends and relatives living in urban area and outside the country. In addition, mobile phones were mainly used for communication with friends and family members.

Similar results were also reported by Souter *et al*, (2005), which pointed out that of the five main categories of livelihoods assets (human, social, financial, natural and physical capital), telephone is most closely associated with social capital.

Close integration between the people living in rural areas and their relatives living in urban areas is important for rural people in terms of remittances from migrant family members and help in times of need. Creating innovative ICT applications that are tailored to the need of the rural people will make ICTs much more relevant to them.

Some mobile phones solutions which are tailored to the need of the rural people in Africa are already in the market, including mobile phone banking and mobile phone money transfer services. In the case of Tanzania, a company by a name of E-Fulusi (T) Africa, trading under the name *Mobipawa*, has created a complete Mobile Banking solution for the people of Tanzania. The Mobipawa service goes by the motto of "*simu ni Benki*" (meaning "a

phone is a bank" in Swahili) became available to the citizens in November 2007 (Mahunnah, 2007). Through this service, people are able to open an account (*Mobipawa* account) where they can deposit and save money, transfer money to other *Mobipawa* account holders and non-account holders all through a mobile phone. Other transactions which can be performed on a mobile phone include payment of certain bills and other simple transactions. Customers can also have their salaries deposited directly to their mobile phone accounts (Sebastian, 2007).

Another aspect of social capital that is facilitated by the telecentres is the provision of a space/venue where people can meet and exchange ideas, information and knowledge. This facility provided an opportunity for telecentre management in two telecentres (CROMABU and Sengerema) to organise the community into a group that among other things operates as credit cooperative society (SACCOS). The SACCOS societies not only help to strengthen the social capital but they also help the community members financially. This is important in communities with no access to banking or insurance services. As the study by Soriano (2007) also pointed out, the telecentres provided an additional common space for communities to meet and exchange information, various employment and other opportunities available, they also exchange information on major events happening in their communities and in the country as a whole.

ICTs and Financial Capital

Financial capital denotes the monetary resources that people use to achieve their livelihood objectives and comprises the availability of cash or equivalent that enables people to adopt different livelihood strategies. In terms of financial capital, telecentre services such as computer training enabled community members to secure employment or self employment opportunities that provided them financial capital. Furthermore, the agricultural marketing information services provided by one telecentre provided farmers with information on prices of their products in various markets within their surroundings.

Therefore, it is crucial for farmers to know the price that their products fetch in other markets especially in urban areas. Thus, information that links farmers directly to markets or wholesale buyers in the markets is very essential. Providing small holder farmers with access to pricing information for their products empowers them to bargain for better prices for their products.

In terms of the impact of mobile phone on their financial capital, the respondents confirmed that their use of mobile phones helps them to save money which could otherwise be used in travelling. In many cases, business people in rural areas reported that they make orders of supplies in urban areas using mobile phones and the supplies are sent to them using the normal public transport system. With local passenger buses (both in large towns and in districts) operating as unregistered but trusted courier companies, the mobile phone e-commerce loop is completed. In the rural areas and in the districts, this kind of business is normally conducted based on trust and a small fee is paid by the users of the service.

Souter *et al*, (2005) reported that the telephone was considered to have value by a high proportion of users when it comes to saving money (for example, by substituting for transport or postal costs), but that it is not considered to have value by most users when it comes to earning income. However, in this study, some respondents indicated that mobile phones create employment and entrepreneurship opportunities through re-selling of the service, selling of the air time vouchers, and operating mobile phone battery charging services**.**

ICTs and Diverse Livelihoods Strategies

Livelihood strategies include approaches that people adopt using assets that they have access to in order to secure livelihoods outcome. It comprises a range of activities and choices that people undertake in order to achieve their livelihood goals (Devereux, 2001; DFID, 2001). DFID (2001) pointed out that livelihood strategies constitute a dynamic process through

which people combine activities to meet their various needs at different times and on different geographical or economical levels.

Providing opportunities for farmers to diversify their livelihoods is very important given the global decline in the prices of the traditional cash crops from Africa. For a long time, farmers in Tanzania have relied on the cultivation of traditional cash crops for their livelihoods and for economic growth and development. These crops include cotton, coffee, tobacco, cashew nuts, tea and sisal. Returns to traditional export commodities have been declining over the years due to a fall in world prices, and as a result, domestic production has declined and farmers who were solely dependent on these cash crops have been deeply affected (Temu and Temu, 2005).

Information provided by the telecentre enabled some farmers to try out new livelihood strategies and adopt them in combination with the existing ones. This was especially the case in Magu and Karagwe districts. In Magu district, a group of women, the *Isandula* women group, learned how to cultivate mushroom and more productive techniques of raising indigenous chicken. This information complemented their traditional livelihoods strategies that relied mainly on the cultivation of cotton as a sole cash crop. Also, young people were encouraged to cultivate vegetables to complement their livelihood strategies which hitherto also relied mainly on cotton cultivation. In Karagwe district, the cultivation of highly valued agricultural products such as spices, vanilla, fruits and vegetable complemented the traditional livelihoods strategies that relied mainly on traditional cash crops such as coffee.

Another form of livelihoods diversification that the rural people are adopting is diversification towards more formal kinds of employment, education and computer training at the telecentres. Parents are diversifying the livelihoods of their children by taking them to school and getting them to learn computers at the telecentre. Telecentres are helping a lot in this by providing information on various educational opportunities in the country and outside the country. For instance, young people in Sengerema district seem to embrace the popular culture that they learn from the Internet. However, these young people also tend to desert rural life for the urban centres, as was also reported by Mercer (2005). The negative aspect of this kind of livelihoods diversification is the diminishing of the human capital resource in rural areas.

Transforming Structures and Processes

Transforming structures and processes represent institutions, organisations, policies and legislation that shape livelihoods (DFID, 2001). They are of central importance as they operate at all levels and effectively determine access, terms of exchange between different types of capital, and returns to any given livelihood strategy (Keeley, 2001). Structures which Devereux (2001) called 'hardware' represent private and public organisations that set and implement policy and legislations, deliver services, purchase, trade and perform all manners of other functions that affect livelihoods (DFID, 2001). Processes which Devereux (2001) called 'software' determine the way in which structures and individuals operate and interact. Important processes for livelihoods include policies, legislation, culture and power relations.

The "transforming structures and processes" aspect of the sustainable livelihoods framework provides macro-micro policy linkages. The sustainable livelihoods framework emphasises the importance of macro level policy and institutions to the livelihood options of communities and individuals. It also stresses the need for higher level policy development and planning to be informed by lessons learnt and insights gained at the local level (DFID, 2001). The framework provides a way of grounding policies and interventions in reality and taking a broader look.

In the ICT sector, policy making strategies, and legal and institutional frameworks at the national level have a profound impact on the accessibility of ICTs by the people living in rural areas. Furthermore, the actions of institutions such as the ministry responsible for ICTs and the regulatory authority, TCRA, also affect access to ICTs by the rural people. So far, processes such as the telecommunications sector reform have brought significant changes to

the telecommunication landscape in Tanzania. However, more pro-poor and pro-rural polices and strategies are needed to address the persisting imbalances between urban and rural access to ICTs. Many ICT initiatives have gone ahead in relative isolation and without the benefit of central and local coordination. Therefore, the networking and central coordination aspect is needed at the national policy making level.

The study further found out that mobile phone access is highly valued by all sections of the community. This is especially the case for its potential role in social communication and in dealing with family emergencies. The mobile phone will be even more valuable because of new services such as mobile banking and money transfer services. This implies that policies that will make this technology more accessible, affordable and ensure quality of services in rural areas will have a substantial social and economic value to the rural communities. At the moment, the quality of mobile phone services in most rural areas is poor, and the networks are always patchy and totally absent in certain areas. The poor people will certainly benefit from improved mobile phone services and will be empowered by opportunities to engage with governance structures. This is due to the fact that the mobile phone technology is being adopted at a very fast rate and new services are always being introduced. Further research to assess the impact of this technology on livelihoods and study the adoption trends over time will be beneficial.

Due to the cross cutting nature of the ICT sector, ICT based project and initiatives should be implemented in coordination with other sectors. The results of this study showed that most farmers are vulnerable to various agriculture-related challenges. However, there was very little cooperation between the telecentres and the people from the agricultural sector both at the national level and at the local level in the districts. The findings of this study show that there is a separation between “rural experts” and “ICT experts” and therefore ICTs solutions do not address the real needs of the rural people. Zappacosta (2008) pointed out that ICT policy is a cross-cutting domain, affecting several policy areas such as technology, research, industry, telecommunications, agriculture, education and health. Without properly considering these elements during the process of policy formulation, ICT diffusion would not match local needs and circumstances and its impact in terms of rural development could be limited or even be negative.

Conclusion and Recommendations

In conclusion, the results of this study show that ICTs are making some positive contributions to the rural livelihoods. Their impact extends to economic issues such as better earnings and saving money, social issues such as community interaction and knowledge sharing, better follow up for remittances and creation of savings and credit cooperative society. The impact also extends to human issues such as – ICT literacy, improved farming techniques and information on new cash crops. The impact of the changes experienced may not be able to fully support and sustain socio-economic development in poor countries. Clearly, improved access to ICTs will facilitate the adoption of diverse livelihoods strategies, thereby make rural livelihoods more sustainable.

This study makes a few recommendations from its findings. Firstly, telecentres should capitalise on building the social capital for the communities they serve. This will help in terms of the sustainability of the telecentres. Simpson (2005) revealed that social capital is important for effective implementation, widespread uptake, greater social inclusion and sustainability of ICT initiatives. The provision of marketing information to farmers is one of the telecentre services which have the potential to produce immediate positive impact on the financial capital and improve the livelihood of rural people. Telecentres should be more active on this. Secondly, old technologies such as radio and television should also be taken into consideration as they play a part in poverty reduction. Thirdly, for the communities and technology to work in harmony, there has to be an enabling environment in terms of appropriate policies, legal and regulatory frameworks and political environment, appropriate locally developed content and the necessary social services such as health services and

schools. Such a framework is likely to facilitate the use of ICTs for sustainable rural livelihoods.

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