The Role Of Ict In Solving Environmental And Socio-Economic Challenges In Tanzania: Case Of Arusha And Manyara Regions

Peter B. Kaaya, Rustus E. Assey

Abstract: This study was conducted to determine the availability and effectiveness of ICT resources that aims at solving people's environmental and socio-economic challenges in Tanzania focusing on regions of Arusha and Manyara. The study in detail examined the role of ICT in solving socio-economic challenges facing community members. Moreover, different frameworks were taken into consideration subject to the intended objectives; the involvements of both quantitative and qualitative techniques were deployed and data collection was conducted through interviews, observation, documentation, focus group discussions and questionnaires in the selected regions. The study findings offers an understanding on the current ICT situation in the local communities, the report further recommended on involving community leaders in educating community members on ICT uses and their roles in the daily routines subject to the available limited resources; insisting on the development of the local contents of the software and applications to be used by community members as well as involving all development stakeholders using ICT enabling people to have access to real time information and fast service delivery in their daily lives and thus total transformation of the country to e-Tanzania.

Key words: Information and Communication technology, Arusha, Manyara, availability, effectiveness, Tanzania, e-Tanzania

1:0 INTRODUCTION

Information and Communication technology is among the fastest improvements in Tanzania despite the challenges combating its move. Currently the government with its intention to bridge the ICT gap and the need to meet its development vision 2025 has managed to implement the national communication infrastructure backbone network in almost 19 regions and covered 59 districts. The President of Tanzania insisted on May 2012 that "...we have so far connected a lot of districts with FOC project and we expect to cover the remaining 11 regions by the end of this year and the remaining districts by June 2013". Completion of the ICT infrastructure backbone project will ensure connectivity from the village level with ICT to the cities. Also the community access points were expected to be established in the colleges, universities, secondary and primary schools. Research centers, post offices, hospitals, local government departments as well as central government were connected. On the same month, 2012 the President launched the "Tanzania Beyond Tomorrow" program aiming at rolling-out computer based teaching program in public schools and is expected to cover about 4000 secondary schools in Tanzania. That program was supported by international organizations and the ministry of education to carter the demands. Moreover, the Ministry of Communication, Science and Technology facilitated the establishment of multipurpose tele-centres in the country since 1999. Currently this Ministry in collaboration with Tanzania Communications Regulatory Authority (TCRA), Tanzania Commission for Science and Technology (COSTECH), International Telecommunication Union (ITU), Non-Governmental Organizations (NGOs), and other public and private organizations managed to introduce a number of tele-centres in various regions. They are operating under non-governmental organizations and other development partners. Also in 2007, the ministry of science, communication and technology established the National Innovation Systems (NIS) under UNESCO support. Its implementation aimed at ensuring sustainable growth and improving living conditions to most of the people in the country. The main question one may need to get answers from, is how far all these initiatives brought relief to the people of Tanzania in the aspect socio-economic development?

1.2 ICT Situation Analysis of the selected Regions

Arusha and Manyara regions with 86,108 km^2 consist of thirteen (13) districts including Arusha city council, Arusha District council, karatu district, Meru district, Babati district, Babati rural district, Hanang district, Monduli district, Ngorongoro District, Longido District Council, Mbulu District, Simanjiro District and Kiteto District. These regions consist of a population of over three million and five hundred (3,500,000) people. Most of its people live in the rural areas and conduct number of activities including agriculture, business, animal husbandry, fishing and tourism. Despite the efforts made by the Government on ICT initiatives to its people, yet the selected regions has been facing a number of challenges including lack of access to information on agriculture, health, education, business and environment. All these challenges necessitated the project team to conduct the research subject to the information that was available at hand on the Government initiatives that has been done so far. The project consisted of the following objectives intended to be achieved: Identifying the development, deployment and enhancement of network infrastructure, devices and contents to support information dissemination; Understanding the applications used and solutions taken towards supporting information dissemination; Carrying out field-based activities that will provide information on the

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availability and effectiveness of ICT in resolving environmental and social-economic challenges in Arusha and Manyara regions.

2.0 Literature Review

2.1 Conceptual framework

Despite government initiatives in improving various ICT facilities and skills in the community, yet there are a number of factor which hinder the efforts from within the community. The limiting factors will only be resolved by increasing awareness and readiness to community members especially the low income people and the ICT illiterate people in identifying the opportunities within available ICT facilities and skills. This will lay a foundation for expertise and development of ICT culture in the community as elaborated in the project's conceptual framework below,

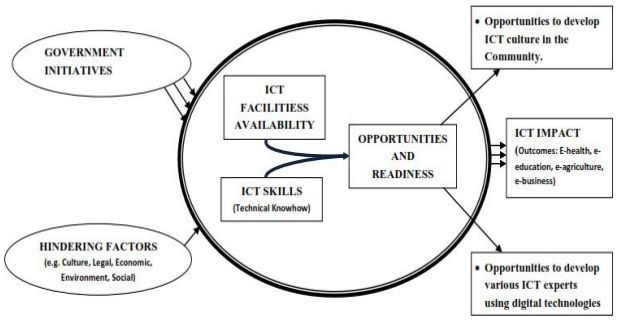

Figure 1: *Project Conceptual framework*

2.2 Empirical Review

In this part, studies conducted by various researchers on ICT role in solving environmental and social economic challenges are examined. Investing in ICT education and application as well as developing local contents applications contributes to the achievement of the life-long development goals, country's development, poverty reduction as well as improving the well being of many. The Tanzania Development vision 2025 also intends to encourage and support ICT training for political decision-makers, community and civil society leaders, as well as private and public sector executives; to develop and deploy a nationwide ICT system to support farmers, traders and extension workers in remote areas; to develop and deploy a nationwide e-Health system that will support medical facilities in the under-served areas as well as developing a nationwide e-Tourism system.

3.0 Methodologies

The study was conducted in Arusha and Manyara regions in Tanzania. The project team used both quantitative and qualitative methods to seek out for information from the six hundred (600) hundred respondents where (16.5%) of them were fully engaged in in-depth interviews, 16.5% of them were engaged in focus group discussions as well as provision of questionnaires to 66.5% who were fully engaged in agriculture, health, education and business. The return rate of the questionnaires was only 90%. Among all, 56.4% were male and 43.6% were female responded.

4:0 Findings of the study and Recommendations

4.1 Analysis on ICT in Agriculture

ICT in agriculture is a very emerging field focusing on the development of agriculture and rural advancement in Tanzania. Despite lack of enough analytical researches done on ICT in agriculture, yet this initiative aims at involving application of inventive and innovative ways to use ICT in the rural areas. It can help to provide accurate and real time information necessary for the farmers that can facilitate a better agricultural output. The types of crops grown in the two regions are as shown below:

Table 1: *Types of Crops grown in the selected regions*

SN	Type of crop	Planting	Harvesting
1	Wheat	December - February	April- June
2	Maize	December -January	June-August
3	Peas	December -early February	August-September
4	Beans	December, march, July	February, June, October
5	Cassava	December, march, July	February, June, October
6	sesame	December -January	April
7	Millet	December- February	From April to June

For people dealing with agriculture in most of the areas in the two regions have access to government crop and farming tools subsidies, they had to be in groups dealing with various types of farming activities. The benefits of ICT are yet to reach to all farmers in the country, especially those who have poor economic condition and social constraint and still depend on agriculture as the back bone of their lives. Other factors affecting them include illiteracy, language barrier, and unwillingness to adopt the new technologies which in turn it is the role of the government to strengthen public private partnerships (PPP) to combat this situation. ICT in Tanzania plays a major role in agriculture as it can help to provide access to information with regard to pre- harvesting, cultivation, post harvesting information, market conditions and product prices. Moreover, direct link between cultivators and buyers can be established and thus help to give farmers more chances to bargain for the prices. Many respondents were very much concerned on lack of ICT training and poor infrastructure that could enable them to incorporate the technology with agricultural activities. This inturn makes a number of people to despise the value of ICT as elaborated in the figure below:

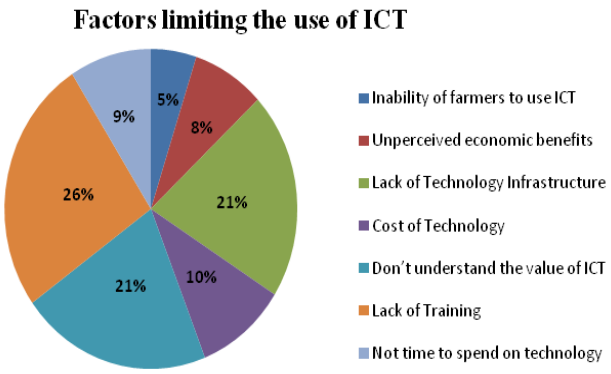

Figure 2: *factors limiting the use of ICT in Agriculture*

Despite having agricultural professionals district to ward levels, yet their limited number was a big constraint to community members in getting real time agricultural education. Moreover, it was found out that, many community members are not aware of Information and Communication Technology and what it implies despite the fact that they live and use some of the ICT resources like mobile phones, radio, television and computers.

4.2 Analysis on ICT in Education

About 16.7% participants were mostly engaged in Education. Most of them commented on lack of training on the ICT resources, lack of knowledge on computers hindering them to use computers as analyzed in the below table.

Table 2: *Reasons for not using Computers in School*

REASONS FOR NOT USING COMPUTERS IN SCHOOLS		
	Responses	Percent
Lack of time to use computers	40	6.7%
Lack of knowledge about computers	97	16.3%
Fear	47	7.9%
lack of confidence	84	14.1%
lack of training	100	16.8%
my age	58	9.7%
Little previous experience.	33	5.5%
Not sure how useful computers are	48	8.1%
Computers are not accessible	68	11.4%
Management doesn't care if I use computers or not	20	3.4%

Many people in the selected communities commented on poor motivation on use of ICT invested to them from the government, ICT professionals, developmental partners, university researchers of which it is the time to educate communities and find the best alternatives to educate them on the role and use of ICT resources in development. A number of teachers have shown a great need towards use of ICT in their teaching and learning activities but many of them had no access to the ICT resources. Many schools visited had few ICT resources and some were used to teach students. Despite limited ICT resources in secondary schools, many schools still had a plan to have more ICT resources that will be used by both teachers and students in teaching and learning. Much emphasis from the government to every secondary school that they must have a computer laboratory, yet they have been facing a big challenge of motivation to use these resources as well as very few ICT professionals.

4.3 Analysis on ICT in Health

The Project team managed to interview about one hundred (16.7%) participants who were mostly engaged in health activities. It was found in most of the hospitals and health centers visited that many activities were manually done, use of files for data recording.

4.3.1 The adoption and use of ICT by patients:

Figure six (6) below provides the overall picture on the use of ICT devices and services of the surveyed areas (Arusha and Manyara regions). The use of Radio has dominated much such that about 70% of the respondents have been using Radio to get health-care information. Also, use of Television (TV) which accounting to 50% of the patient responses. The use of computers, emails, mobile applications and fax machines were the least in terms of use by the respondents. This indicates that traditional means are still heavily used by many patients in Tanzania. This implies the slow speed in the use of computers and other modern health facilities in most of the developed world. Another suggestion could be that many public health services have to effectively make use of Television and Radio to so as to be able to reach larger number of the population with health information.

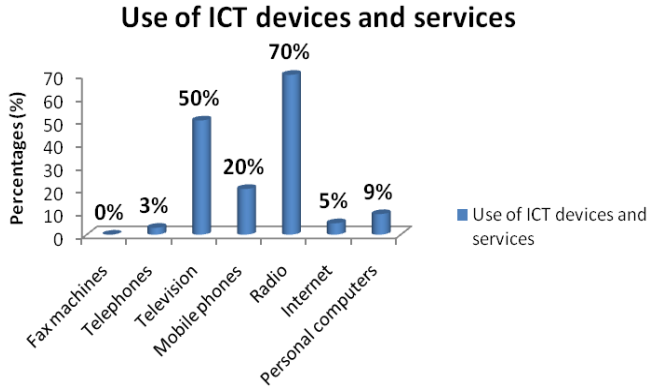

Figure 3: *Use of ICT resources by patients*

Despite a great need on the use and application ICT in simplifying many activities in the health sector, very few hospitals of about 10% had initiated some systems like Health information systems. These systems were mostly available in the district hospitals, referral hospitals and regional hospitals. There were a number of reasons stipulated by some of the health professionals on the challenges they face in accessing and using ICT as shown in the figure seven (7) below.

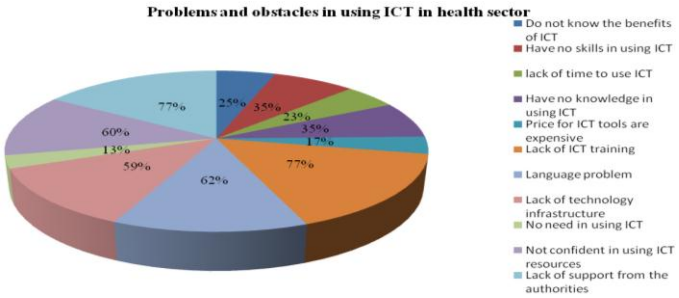

Figure 4: *Problems and obstacles in using ICT in health sector*

Among the reasons commented by many health respondents were poor support from the health management (62%), problem of language used in the health applications (77%), and the biggest challenge was lack of ICT training to most of the health workers (77%). Some of the patients interviewed by the research team commented that "… if there is any solution towards fastening health service, it will be of great help because we use to stay in the hospital for the whole day despite being out patient". One of the coordinators of home basic care said most of the information from the health centers is supplied to community members through advertisements, radio, and letters to the village officers. This has been a big challenge as many people use to get information lately. He further commented that if ICT resources are to be put in place, this problem will reduce very much and the work will be simple. Nurses will be able to attend more people than they are used to do now. The use of ICT applications especially e-health is inevitable in the current world of science and technology. It is through use of these applications that will help to improve health care services in the country. These findings provide an insight to various sectors including the ministry of health and social welfare, private organizations and health policy formulators to emphasize the adoption of e-health systems for improved services in all health centers both in urban and rural areas. The main reasons for implementing e-health systems are broad. Firstly, they help to extend geographic access and thus overcoming long distances between physicians and patients by replacing a traditional office visit as it is conducted now. Moreover, e-health facilitates effective communications between health workers and patients even outside regular working hours. Most of the health workers had different perceptions and views regarding the support of ICT in their daily activities as elaborated in figure 8 below.

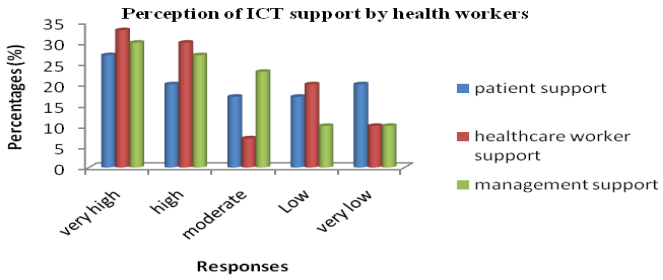

Figure 5: *Perception of ICT support by health workers*

4.4 Recommendations

Due to inadequate ICT capacity and know how in the community, the project team requests financial and material support to provide training to the school teachers, students, emphasize on the use of the Computer syllabus in secondary schools, train local leaders and community members and health workers on how to use ICT tools in the selected regions and the whole country at large. The project team recommends that, implementation of any application or any solution should only be done after a thorough investigation between needs of the community members and applications' contents. Thus ICT resources have to be customized to address different information needs in various aspects in a useful format so as to assist in addressing problems people face. Unless all factors remain constant, the project team believes that with the support from the project funders, implementation of the suggested applications can also be applied to other communities in all regions of Tanzania to resolve similar problems. The project team also recommends to the government through the rural Energy Agency (REA) initiative to subsidize the costs of tapping electricity services in all rural areas in Tanzania to enable a lot of community members to have and use electricity. Due to the fact that most of people in the two regions especially majority from rural areas lack awareness on developments in the ICT sector and its potential contribution to national development, there is a need to provide education about developments in the ICT sector, particularly on availability of broadband communication facilities, and how these developments can be used to harness and enhance economic development. Research and Development (R&D) activities in the ICT sector are limited in Tanzania which makes it very difficult to establish or predict trends in the sector without carrying out extensive research. Stakeholders (government and private), could take an interest in research and development activities as a basis for sustainable growth and development of this ICT sector. Mobile phone operators can help ensuring quality control through the sale of low-cost quality handsets, reduce communication costs subject to affordability of low income people in rural areas, and put much pressure on applications of mobile phones in health, environment, business, tourism, education and agriculture. For fast adoption of e-health systems that can carter demands of many low income people in far geographical areas, adoption of health information systems that support mobile technologies are highly recommended. Policy makers are also advised to effectively make policies that can make changes to the current situation so as to create an enabling e-Tanzania for the adoption of e-health, e-education, e-governance, e-environment, e-agriculture and e-business.

5.0 Conclusion

Despite government initiatives on ensuring Information and Communication Technology (ICT) in the country, it was found that most of the implemented ICT solutions have only ended at the level of council and mostly in urban areas. Many community members have been denied access to information resources including ICT. Of all areas visited by the project team in the selected regions, it was found that, the only ICT resources available were radio, televisions and mobile phones of which people had only been using them for calling, messaging and to some extent mobile money

services. Some people who had access to Televisions were challenged by the biggest problem of electricity fluctuation, and other people were even not able to afford costs of having electricity in their homes. The current government initiative through Rural Energy Agency (REA) should be applied in all rural areas in the Country. For the available ICT resources to be effective, they have to carter demands of the community members subject to people's levels of education, language content, financial positions, coverage as well as their availability. The project team believes that if good infrastructures are ensured to reach all people in the rural areas, if ICT applications are converted into local contents and if more emphasis and education is provided especially to secondary school students, it would be easier to impact the information and communication technologies to all community members in the country and hence every person will adversely change with change in time and technology. Thus, the project team believes that, ICT is in a very high position to offer opportunities for all as it requires confidence, local service and establishment of a number of local technologies.

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