The Role of ICTs in Improving Livelihoods in Kenya: Perspectives from Pastoralists Communities

Kadimah, Susan Otete

(Masinde Muliro University, Kakamega, Kenya)

Abstract: *Pastoralist communities in Africa occupy rangelands that are underdeveloped with harsh climate conditions worldwide. They live a nomadic lifestyle and derive their livelihoods from extensive livestock keeping. In Kenya pastoralists are faced with the same challenges but they are particularly vulnerable to poor infrastructures, draughts, perennial cattle rustling and isolation from access to social services. ICTs have the capacity to develop sustainable livelihoods of individuals' and communities' capital assets, capacity building, individuals' capabilities, improving innovations, facilitating social networks and inspiring social and political participation. However, the major challenge is integrating ICT into the agricultural development of pastoralists whose lifestyle is nomadic. The purpose of this study was to look at the role of ICT in empowering pastoralists in in Kenya. The study employed the e-Resilience Framework. Purposive-sampling technique was adopted while qualitative data was collected using document analysis, interviews and reflective conversations methods. Primary data was collected from 10 key from Pastoralists, Kenya Research and Communication Network, key stakeholders from the Ministry of Agriculture and Non-Governmental Organizations. Qualitative methods were thematically analysed and for triangulation purposes. The findings established that, there is a great amount of development in the implementation of the ICTs services delivery in pastoral communities in Kenya. However, significant barriers for effective learning and utilization of ICTs for sustainable agro-pastoral livelihood still exist leading to acute challenges in delivery of timely information and knowledge about weather conditions and advise on animal husbandry to the users. It was further established that, it has been a challenge in coming up with innovative solutions that can enable policies that carter for pastoralists' unique lifestyles. Language barrier was also identified to be a basic constraint in all tele-centres because most of the ICTs are written in English language, which as a result of high literacy levels led to lack of content conceptualised by most pastoralists. The study recommends that development of key ICT infrastructures, skills to use the technology and affordability of the same should be considered by counties inhabited by pastoralists in order to improve their livelihoods.*

Keywords: Pastoralists, Rangeland, Capabilities, Communications Technology, Networks.

1. INTRODUCTION

According to Netherlands Development Organization SNV (2012), Sub-Saharan Africa has more than 25 million pastoralists who depend on mobile livestock-keeping for their livelihoods and over 200 million agro-pastoralists who combine mobile livestock-keeping with agriculture. They represent over a quarter of the total population in Africa and occupy 43% of the continent's total land mass (SNV, 2012). Pastoralist communities in Sub Saharan Africa are located in areas that are underdeveloped with the world's most severe environments. Furthermore, they occupy range lands and live a nomadic lifestyle deriving their livelihood from extensive livestock keeping which entails moving from place to place in search of pastures for their livestock.

Pastoralists' contribution to the agriculture GDP in Kenya, Tanzania, Uganda and Ethiopia is estimated at 50%, 30%, 12% and 19% respectively (World Bank, 2015). However, 75% of Kenya's population of 44.9 million people depend on agriculture, which contributes 26% to the nation's GDP and 60% of foreign exchange income (FAO, 2010). According to World Bank (2015), a third of the total land area of Kenya is agriculturally productive with only two thirds semi-arid to arid, characterized by low, unreliable and poorly distributed rainfall. These areas lie in the Northern and Southern regions and are a home to approximately four million pastoralists. They engage in livestock farming thus contributing 26% of the total national agriculture GDP (Kirk Bride and Grahn, 2008). Despite the economic potential of pastoralism, pastoralists worldwide are vulnerable to food insecurity and poverty (Clover, 2003; FAO 2010).

According to Chilimo (2008) Information Communication Technology for Development (ICT4D) is the use of ICTs in the social, cultural, economic and political development of individuals in providing essential information and knowledge that can improve the well-being of individuals and communities, particularly in developing countries. Notably, ICT has been recognized as a necessary tool for achieving the Millennium Development Goals (MDGs) such as, goal number eight engaging global partnerships in poverty reduction (Kuriyan *et al.,* 2010). Similarly, Zheng *et al.,* (2011) adds that, the purpose of emphasizing the use of ICTs is to produce socio-economic change, reduce poverty, solve inequality problems and to reduce the gap between access to information between rich and poor populations of rural communities.

2. PROBLEM STATEMENT

ICTs have been embraced globally as a tool of achieving Millennium Development Goals (MDGs), particularly goal number eight, dealing with global partnership on poverty reduction. Chapman *et al*., indicated that ICTs presents the means of reducing poverty as established in their study on collaboration of agencies among rural communities in developing countries. Similarly, Chilimo in his study advances that ICTs enable sustainable livelihoods by assisting in developing capital assets of individuals and communities; capacity building; enhancement of individuals' potential; creating innovations; providing social networks; and inspiring social and political participation. Kerkrade pointed out that current researches on pastoral communities of Kenya indicates that they are vulnerable to: poor infrastructures, perennial cattle rustling, isolation from access to social services, and climate induced shocks such as droughts that hit the Horn of Africa in 2011 among other vices.

Although Kenya has agricultural reform programmes to a liberalised agricultural sector, there is evidence of challenges of poor support services such as inaccessible roads, information and market centres among others. As a result of minimal or lack of existence of ICTs within these pastoralist communities due to the above factors, it is challenging to access timely information about security threats, weather patterns, epidemics and disease that affect livestock which is pastoralists main source of livelihood. Whereas ICTs are currently being used in crop production in agriculturally viable areas, there is minimal evidence about the same being done in livestock production especially in arid and semi-arid areas. This further affirms that the challenges of ICT use among pastoral communities of Kenya have not been effectively explored by researchers thus lending further credence as to why this study was necessary. Therefore, integrating ICTs into areas such as agricultural extension services, information and knowledge in livestock production are essential in empowering pastoralists' for sustainable livelihoods.

The main aim of the study was to establish pastoralists' perspectives on the role of

ICTs in improving their livelihoods in Kenya.

3. THEORETICAL FRAMEWORK

The study employed the e-Resilience framework proposed by Heeks *et al.,* (2010). They adopted the framework from the Sustainable Livelihood Approach (SLA) advanced by Scoones (1998). In livelihoods discourse, sustainability refers to coping with immediate shocks and stresses, where local capacities and knowledge need effective support (Scoones, 1998). Similarly, McLean (2015) posits that a livelihood comprises people, their capabilities and their means of living including food, income and assets whereas sustainability refers to environmental and social facets.

Scoones (1995) gives an example of cases of mobile pastoralists who face the shocks and stresses as a result of climatic conditions. According to Heeks *et al.,* (2010), e-Resilience is a component of livelihood systems which is able to link ICTs with a set of resilience sub properties. Consequently, adaptability to effects of climate shocks such a draughts and floods are relevant measures to be applied in using this framework. Further**,** Heeks *et al.,* (2010) points out that a systemic analysis of resilience leads to an in depth of conceptualising mechanisms of adaptation that are far much suitable to address the vulnerability leading to sustainable development for livelihoods**.**

4. PASTORALISM PRACTICES

Kerkrade (2008) defines pastoralists as nomadic people who inhabit rangelands deriving their livelihood from extensive livestock keeping by moving from one place another. They depend on scarce natural resources with harsh unstable conditions which make them vulnerable to poor infrastructures, draughts, perennial cattle rustling and isolation from access to social services. It is essential for pastoralists to have knowledge on animal husbandry, sustainable rangeland management and informal livestock markets in order to survive (Kerkrade 2008).

FAO (2010) in their study on pastoralists lifestyle established that, over 40 million pastoralists and agro pastoralists in the Horn of Africa are perennially undernourished and food insecure. The study found out that in East Africa, pastoralism is still adopted as a way of life and source of livelihood, unfortunately policymakers do not realize the contribution pastoralists make to economic growth in those countries. They further indicated that climate change has an impact on the environmental, social and economic uncertainty and therefore requires pastoralists' equipped with knowledge and experience on livestock management that can be utilised in the overall management of Africa's dry lands.

Pastoralists' contribution to the GDP of Kenya, Tanzania, Uganda and Ethiopia is estimated at 50%, 30%, 12% and 19% respectively. Kenya's pastoralists alone contribute about three-quarters of a billion dollars a year. However, it is unfortunate that pastoralism is seen by many as a backward activity, which is not economically stable hence regarded as destructive to the environment. Notable, hundreds of dry land pastoralists in Kenya live in absolute poverty that is characterised by conflicts and environmental degradation that has been overlooked by government policy makers over a long period of time (Macgregor and Hesse 2013).

They further pointed out that, pastoralism as a sector is estimated to be worth US$800 million a year in Kenya alone, however in regard to nationally produced goods and services, there are no clear records showing the importance of pastoralism as an aspect of economic development in. Despite all factors mentioned such as their contribution to economic growth and environmental change, pastoralist communities' worldwide face challenges of food

insecurity and massive poverty. Zheng *et al.,* (2011) posits that in regard to the findings from several authors mentioned it was clear that pastoral farmers require timely information on weather conditions, advice on maintaining healthy livestock under favourable conditions from relevant persons, and information on markets to empower them for sustainable livelihoods.

5. THE ROLE OF ICT IN RURAL DEVELOPMENT

European Union countries have adapted the use of Information and Communication Technologies (ICTs) to enhance agricultural production, environmental management, diversification of microeconomic activities leading to improved quality of life in the region (Kamel, and El-Tawil, 2009). This has led to the rapid spread of (ICT) in developing countries creating a unique opportunity to transfer knowledge via private and public information systems.

Heeks (2002) points out that all over the world, ICTs have been used in different aspects of development for the improvement and empowerment of rural communities livelihoods. According to Zheng *et al.,* (2011), ICTs play the role of several functions such as; influencing a community's social, cultural, political and economic change. The use of communication technologies such as radio, television, Mobile Phones, computers and network hardware and software to improve the well-being of communities by helping reduce poverty and inequality.

Kamel, and El-Tawil, (2009) adds that, ICTs are key to the reduction of poverty, inequality and a bridge between information-rich and information-poor populations worldwide. The movement of ICT into rural areas provides unique opportunities to producers of rural products, agriculture/agro- processing products, rural handicrafts etc. to have direct access to markets. These has seen the UN ICT Task Force and Global Alliance for ICT and Development (GAID) work with stakeholders in many areas regarding the use of ICT to attain numerous globally established development schemes, comprising the Millennium Development Goals (Sam, 2013).

In addition, Chapman *et al.,* (2003) explains that, the rationale for the worldwide attention on ICT use for development and social change is understandable because ICTs are essential for providing access to information in several regions of human development in rural communities. Furthermore they have the capacity to foster sustainable livelihoods by assisting in developing the capital assets of individuals and communities; building the capacity and capability of individuals; improving creative innovations; facilitating social networks; and inspiring social and political participation (Yang *et al.,* 2009). This therefore makes access to ICTs vital for both economic and social development. However, the worldwide spread of ICTs is insufficient with more than half of the population, particularly in developing and underdeveloped countries.

Heeks (2002) pointed out that the use of ICT requires proper empowerment to the users because of high professional skills which most rural community users lack citing an example from a research done in Northern Kenya and southern Ethiopia which is occupied by pastoralists. Surprisingly, it was found that only few pastoralists have no self-belief on external weather forecast. This makes it clear that, empowerment can only be successful if users' are willing and can embrace the use of ICTs before disseminating information so as to bring positive change. However, since empowerment is a process it requires mechanisms that help individuals acquire relevant skills.

Heeks (2010) argues that even if connectivity and access are available for development, illiteracy still remains a challenge for the use of ICTs. This argument implies that the current tele-centre approach to supporting communities with technology although effective in some cases is characterised by challenges regarding financial, social and political sustainability. The findings in most studies depict that the optimal way of ensuring economic success of ICTs in communities is through local participation as well as strengthening social institutions in support of new technologies. It is arguably true that ,the utilization of ICTs in marginalised communities such as pastoralist communities would prefer it to in-corporate culturally appropriate interfaces not only as avenues for information to be disseminated and exchanged , but for local content creation, if there is to be meaningful uptake of ICTs in these communities.

6. RESEARCH METHODOLOGY

The study employed a combination of cross-sectional and case study research designs so as to enable detailed examination of the tele-centre services offered towards and pastoralists for sustainable pastoral livelihood. The focus in case design was on issues that are common or not common to all cases, as well as, unique and specific to a particular case. Purposive sampling technique was employed in this study to determine the respondents. According to Mugenda and Mugenda (2003) purposive sampling is a process sampling units within the segment of the population with the most information on the characteristic of interest. Government officials drawn from the Ministry of Agriculture and Ministry of Information and Communication were purposively sampled to participate in the study. In addition, officials and experts from NGOs and Agricultural Officers working in pastoralist communities and village elders from the study area were purposively sampled to participate in the study.

Primary data was collected from 40 purposively selected respondents through the use of skype and mobile phone communication interviews. 30 of them were key informants from Virtual Extension Research and Communication Network (VERCON), heads of department from key government ministries that are in charge of agriculture, ICT and rural development and Non-Governmental Organisations that have a role in implementation of programs and policy formulations. The remaining 10 respondents were village elders selected from the study areas through snowball sampling technique.

Prior to the actual data collection, the instruments for the interview were pre-tested to determine their validity and reliability by the researcher who had to establish by directly liaising with relevant sector experts on whether the instruments were good for the research. The feedback from the experts was put into consideration to enrich the data collection tool. On the other hand secondary sources of data (published and unpublished) was also collected and used to substantiate the discussions.

Thematic analysis approach was used on selected themes based on the semi-structured interviews and questions which captured transcribed data from the individual interviews. According to Schutt (2012), using thematic based data analysis technique to organize and analyse qualitative data improves the process of data analysis by making it easier, faster and enabling the relationships of different codes to be worked out. Prior to conducting the research project, ethical clearance was sought from the School of Agriculture and Policy Development Research Ethics Committee at the University of Reading. Consequently, participants were briefed about the objective of the research and how confidentiality will be guaranteed through a participant's information sheet.

7. FINDINGS

7.1. The Role of ICTs in Pastoralism Practices in Kenya

The objective of the study was to establish pastoralists' perspectives on the role of ICTs in improving their livelihoods in Kenya

7.2. Discussions

The findings indicated that relevant policies need to be developed and more effectively implemented to yield positive results to pastoralists. Moreover, even though ICTs have gained popularity and attention as a way of improving pastoral communities' livelihoods, its full potential has not been achieved because the policymakers within government ministries do not take into consideration pastoralists' contribution to economic growth. The problem is partly due to inadequate information on the comparative advantages of pastoralism over alternative land uses.

The undervaluing of pastoralism potential makes pastoralists vulnerable to food insecurity and poverty (FAO, 2010). It is only by investigating the overall contribution of pastoralism to society that its potential can be realised and valued. Unfortunately the focus has been on direct and easily measurable values as opposed to indirect values. The findings also revealed that specific determinants of technology adoption rely on the location and the technology type. These determinants include education, wealth, tastes, risk preferences, complementary inputs, and access to information and learning as posited by Anderson and Feder (20007).

Pastoralists believed that due to the kind of lifestyles they lead, ICT based approaches seems to be expensive because of limited supportive infrastructure such as electricity supply to the necessary ICT facilities. In addition, they sited lack of the right or properly trained personnel who could guide them as nomadic or mobile pastoralist communities regarding ICT related matters which conversely seems to exacerbate the cost of implementation. Therefore, more efforts need to be put in place for the success of ICT use amongst pastoralists of Kenya. However, the research established that perceptions of pastoralists regarding the use of ICT for development such as mobile phones/ internet use in regard to agricultural/ livestock production for sustainable development was not clear because they use mobile phones for social discourse such as communicating with relatives, receiving and sending money, for example Mpesa or Airtel money.

Regarding the use of mobile phone to access information concerning their livestock, village elders categorically said that they did not have knowledge on how to use a mobile phone to care for animal rearing, but except maybe to call the veterinary officer to come and see the animals in case of a disease outbreak or to find out when vaccination should be done. According to the findings, mobile phones have radios but they alleged that there were no programmes that address pastoralists' challenges regarding livestock farming among nomads. They went on to give an example of a programme on Radio Citizen called shamba Shape up which they said was mostly for other communities who have large farms and not pastoralists whose lifestyle is unique.

Further, it was established that pastoral communities have got information on appropriate technologies for fodder production and conservation. This information has helped them ensure that cattle maintain good health even during dry seasons. The timely warning system has also helped livestock keepers cope with agro-pastoralism challenges. Due to current extensive ICT usage across the country, respondents indicated that there is now faster and improved communication among pastoralists' communities unlike before. Besides just accessing the required information, the communities can now also network easily and learn

from each other the best practices. Besides having knowledge generation and dissemination leading to increased awareness among pastoral communities, respondents indicated that there is also increased production of farm produce and improved information packaging from other sources to the pastoral communities.

From the village elders interviewed, illiteracy level was high among pastoralists because of their mobile lifestyle that hinders their children from attending school regularly. Therefore, high illiteracy rate amongst pastoralist communities means that communication between agricultural/ livestock officers and Kenyan pastoralists is hampered because of language barrier. Furthermore, most of the officers who work in these regions come from other communities hence are not able to communicate in the local language which is a communication barrier. This means that important information is not clearly conceptualised by both players (pastoralists and agricultural extension officers).

Lastly, the research found out that in case of disease outbreak, they actually do not get much help from agricultural extension officers since they mostly rely on traditional methods of treatment. Furthermore, because of their nomadic way of life, the agricultural extension officers find it difficult to offer follow up activities for effective services. FAO, (2014) adds that, Public agricultural extension services have been deteriorating in performance since the 1980s because of inadequate funds from the national and international bodies, understaffing, staff training opportunities, and inadequate regulatory frameworks. Similarly, World Bank, (2015) also found out that, farmers face challenges because of inadequate support from agricultural extension services which is basically scientific and instructional. Although agricultural extension has been well applauded for the crucial role it plays in the development of the agricultural sector through the promotion of a sustainable, inclusive and pro-poor economic development and poverty reduction it is not realized by Kenyan pastoralists who are isolated due to their nomadic way of life.

8. CONCLUSIONS

The study sought to establish the role of information and communications technologies in improving livelihoods in Kenya as perceived by the pastoralists. Key themes emerged from the research findings indicating that the progress in the development of ICT service delivery for agriculture production in pastoral communities in Kenya still faces challenges of effective learning and utilization of for sustainable agro-pastoral livelihoods.

9. RECOMMENDATIONS

Based on the conclusion that there were still challenges facing utilisation of ICTs in enhancing sustainable agro-pastoral livelihoods in Kenya, the study recommends that development of key ICT infrastructures, skills to use the technology and affordability of the same should be considered by counties inhabited by pastoralists in order to improve their livelihoods.

10. LIMITATIONS OF THE STUDY

This research achieved its aim of establishing the role of information and communications technologies in improving livelihoods in Kenya as perceived by the pastoralists. However some limitations were encountered these includes the following: - in some instances the researcher had difficult time administering the data collection instruments since some of the respondents (pastoralists, community leaders) were semi illiterate and the researcher had a difficult time explaining the complex terms and concepts as related to the study variables.

It would have also been preferable to do a survey on all the pastoral communities in Kenya but it was unattainable considering the limited time and budget constraints. It was also

difficult at times to secure appointments with pastoralists since they are nomadic in nature. Lastly the expansive rangelands occupied by the pastoralists were also difficult to access because of poor road networks and rough terrains.

11. SUGGESTIONS FOR FUTURE RESEARCH

Further research should be conducted to include more variables and more vigorous methods for analysis to find out more on the utilisation of ICTs for sustainable livelihoods among the pastoralist communities.

Secondly, a longitudinal study to assess the role of ICTs should be carried out to help establish whether there is a long term effect sustainable livelihood when these technologies are involved especially in information provision. Lastly, this study only addressed few of the commonly mentioned antecedents of pastoralist practices the literature whose impact may differ based on context and time. Thus, future research should consider including multiple items suggested by different scholars to widen the scope and enrich the study.

REFERENCES

1. Anderson, J.R., & Feder, G. (2007). *Handbook of Agricultural Economics*. Agric. Extension. London Press.
2. Chilimo, W. (2008). Information and Communication Technologies for Sustainable development in Kenya, *African Security Studies* 10(2),pp. 24-40
3. CIDA (2008) CIDA's Strategy on Knowledge for Development through Information and Communication Technologies. Accessed 20-07-2016 from http://www.acdi-cida.gc.ca/.
4. Clover, J. (2003). Food security in sub-Saharan Africa. *African Security Studies*, *12*(1), pp. 5-15.
5. Colle, R.D. (2004). ICTs, tele-centers and community development. Information Technologies and International Development. *Communications in Statistics - Simulation and Computation*, 35(2), pp. 277-300
6. FAO (2014). Public expenditure. Monitoring and analysing food and agricultural policies (MAFAP) online database (retrieved July, 2014) (available at http://www.fao.org/mafap/ database/public-expenditure/en/)
7. FAO (2010). *"Climate-smart" agriculture*: Policies, practices and financing for food security, adaptation and mitigation. Rome
8. Gomez, R. & Gould, E. (2010). *The "cool factor" of public access to ICT*: Users' perceptions. London
9. Heeks, R. (2002). Information Systems and Developing Countries: Failure, Success and Local Improvisations. The Information Society, 18(2), pp. 101-112.
10. Heeks, R. (2010). Do Information and Communication Technologies (ICTs) Contribute to Development?'. *Journal of International Development*, 28(22), pp. 625-640.
11. Kamel, S. & El-Tawil, M. (2009). The Impact of ICT investments on Economic Development. *Electronic Journal of Information Systems in Developing Countries*, 36(1), pp. 1-21
12. Kirkbride, M., & Grahn, R. (2008). Survival of the fittest: pastoralism and climate change in
13. Kuriyan, R., Kitner & Watkins, J. (2010). *ICTs, development and trust*: An overview. KwaZulu-Natal, Pietermaritzburg
14. Mugenda, O.M & Mugenda, A.G. (2003*). Research methods:* Qualitative and Quantitative Approaches. Nairobi: African centre for Technology Studies.

15. Sam, J. (2013). The Use of Information and Communication Technologies in Poverty schools in relation to integrated pest management. *World Dev*. 35(4), 663–686.

16. Schutts, T.W., (2012). *Transforming Traditional Agriculture*, Yale Univ. Press, New Haven, CT.

17. Scoones, I. (1998). *The economic value of livestock in the communal areas of Southern Africa*. London: IT Publications

18. Scoones, I., (1995). *Living with uncertainty*. New directions in pastoral development in Africa. London: IT Publications

19. SNV Annual Report 2012: http://www.snvworld.org/CAR2012

20. World Bank, (2015). *Impacts of extension services in rural Mozambique: Rural livelihoods worldwide*: Options for institutional reform in the developing countries. FAO, Rome.

21. Zheng, Y. & Stahl, B.C. (2011). Technology, capabilities and critical perspectives: *What can Zimbabwe. Agric. Sys*. 2(39), pp. 339–359