Enhancing Access and Use of Climate Information through ICTs

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Enhancing Access and Use of Climate Information through ICTs

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ABSTRACT

Although the role of ICTs in improving human life in Kenya is acknowledged widely, the focus of much of ICT-related developments has been on human experiences at the level of disease and needs for communication and mobility. Less obvious is how such technological interventions may be used to address seemingly abstract yet grave concerns like climate change and its impact on the quality of human life. This review paper, therefore, shall investigate the different situations where ICTs may be deployed in relaying packaged and relevant localized climate information that can help rural farmers in Kitui County, Kenya to make pertinent and timely decisions to improve their productivity and, ultimately, their livelihoods. We hypothesize that rural communities' use ICT tools such as the mobile phones and the community radios to access localized climate information (weather, seasonal forecasts, and agro-advisories) and that livelihood assets and livelihood strategies positively change with the increasing availability and use of the ICT-based climate information. The idea of the paper presented is to merge theoretical and applied research outcomes to narrow the gap between the theory of ICTs usage and the practice of it, while linking it to climate information and enhanced rural livelihood strategies. The review of this paper shall be captured in social-scientific terms, and shall contribute to knowledge by helping researchers and policymakers to determine climate information needs of rural ASAL communities, knowledge on innovations related to ICTs, among others.

Keywords*: ICT Tools, Climate Information, Sustainable Rural Livelihood*

1. Background of the Study

The role of Information Communication Technologies (ICTs) in contemporary life has become increasingly indispensable. In fact, virtually all forms of human development are now traceable to advances in the spread and use of ICTs. As Finlay and Adera (2012) state, “the role and the potential of ICTs in helping communities employ innovative approaches to prepare for, respond to and adapt to climate change are increasingly being recognized." This sense of innovation has transcended the earlier geographical and economic barriers that had limited their spread, to the extent that currently, even areas and people that are considered marginal are now making innovative use of ICTs to improve their livelihoods. In *ICT Pathways to Poverty Reduction: Empirical evidence from East and Southern Africa*, Adera and Waema *et al*. (2014*)*, examine the different ways in which ICT can and has been used to understand and

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ameliorate the 'ICT/poverty nexus' in Africa, while drawing evidence from countries like Rwanda, Kenya, Namibia, and Tanzania. This same idea had earlier been interrogated by Ospina and Heeks (2012) in "ICT-Enabled Responses to Climate Change in Rural Agricultural Communities," in which they demonstrate the different ways in which ICTs "can enable new responses to the challenges posed by more frequent and intense unpredictable climatic events and stress." ICTs can be viewed as a catalyst for achieving climate change goals (SDG13), gender equity (SDG5) and Food Security (SDG 2) as stipulated in the Sustainable Development Goals (SDGs). And to the targets determined by COP-21, whereby ICTs can play a crucial role in disseminating weather and climate information and in forecasting and early warning systems to promote sustainable climate change adaptation (UNDP, 2016). The idea that ICTs, in general, can be used in dealing with climate and socio-economic challenges is, therefore, one that calls for further studies to find ways of exactly how the same can be used to enhance livelihoods.

Access to climate information (weather and seasonal climate forecasts and agro-advisories) and ICTs for climate change adaptation is, therefore, essential to enable actors to anticipate long-term risks and make the appropriate adjustments to increase their resilience. However, despite significant scientific gains in predicting the climate, often there is a lack of climate information available at the rural community level due to uncertainty in localized climate projections and seasonal forecasts, or due to lack of information on particular local climate indicators, such as increasing rainfall variability and temperature rise (Vogel and O'Brien, 2006). Even when climate information is available, incorporation of scientific climate information into local decision-making may not often occur because of the way such information is communicated and disseminated (Patt and Gwata, 2002; Vogel and O'Brien, 2006). Several studies have shown that there is a need to make climate information more accurate, accessible, timely and useful for rural communities (Vogel and O'Brien 2006; Hansen *et al*., 2007).

A relatively new area of study about ICTs is how they can be used to enhance the greater flow of climate information to empower people in decision-making, especially in this era of climate change. Therefore, this review paper has identified the need to examine how climate information, as part of the larger concern with climate change, can be disseminated to establish ways in which people deal with the inherent challenges of climate change. In the unfolding trend, the nexus between ICTs and climate information is undoubtedly important, yet it remains one of the least studied areas. This is what the researcher seeks to review, with a focus on the mobile phone and Frequency Modulation (FM) radio cultures. The mobile phone and FM radio stations lend themselves to more focused study because, as recent works of literature show, the two are the most widely spread and at the same time most effective in impacting the lives of people. As Okinda and Adera (2014) suggest, "of the different ICTs, mobile phones and radios were found to have contributed to the improvement in people's social and economic livelihoods much more than internet and fixed line telephone."

1.1 The Role of Mobile Phones and FM Radio Stations in Relaying Climate Information

The mobile phone and FM Radio stations have become ubiquitous in Africa generally and Kenya particularly. As forms of Information Communication technology, these two phenomena have transcended boundaries of class, geography, and gender to assume new forms of significance and usage. Indeed, research and anecdotal evidence suggest that virtually every household in Kenya, even in rural areas, has a member that owns a mobile phone and a radio. Indeed, the current brands of mobile phones have FM radio features that enable their owners to listen to programs even when these members do not own radios, or when they are out of their homes. In a sense, the FM radio stations and their broadcasts have become as mobile as the mobile

phones (Waema and Okinda, 2011; Cherotich *et al.*, 2012).

At the same time, authorities in government, the corporate sector, educational institutions and, of course, the mass media, have found these two artifacts to be important outlets in communicating general information, news, debates on topical issues, commercial advertisements and reportage on issues that affect specific peoples and regions in the country. Indeed, the general public currently looks up to the mobile phone and the FM radios as their sources of information and entertainment, especially information on how best they can profit from realities within their physical and social reach. For examples relevant to this subject, the RAdio InterNET (RANET) project housed at the Kenya Meteorological Department has been found useful and is a mechanism for enabling targeted vulnerable rural communities receive extreme weather and climate information as well as other public-good information in formats and languages they understand. There are few stations established such as in Suswa, Kangema, Budalangi, Kwale, Isiolo, and Baringo, where these stations are run by local steering committees with guidance provided by a team from the Kenya Meteorological Department (KMD). The rural communities have been able to receive, timely, weather and climate information, timely warnings about impending natural disasters, timely agricultural and marketing information and a forum for discussion of local issues so that it would lead to the solution of problems. Farmers have accessed agricultural extension officers through their mobile phones, while also learning valuable lessons through FM radio programs that relay important market related and technical information, all with a view to enhancing the people's livelihoods at a time when food insecurity has become a concern to many stakeholders (Odhiambo, 2007; McOmber *et al.*, 2013).

In acute Arid and Semi-Arid Lands (ASAL) such as in Kitui County and the entire eastern Kenyan region, farmers have long faced the ravages of desertification and crop failure because of climate change and unsustainable agricultural practices. Changes to agricultural practice proposed by experts, extension workers, and educational campaigns have frequently met with opposition and an unwillingness to modify long-held behaviors and ancestral practices related to agriculture. For thousands of farmers, this has resulted in food insecurity, poverty, and loss of livelihoods. This results in major challenges in such areas to ensure adequate food production for the growing populations without degrading the limited resources (Kitui County Government, 2013). To ensure that these conditions do not perpetuate the state of food insecurity, there is an urgent need to improve access to information by the rural populations that may help improve on agricultural yields, productivity, and the farmer's livelihood. Such information can be packaged helpfully for transmission via the FM radio and mobile phones. Our position on this matter, indeed why we find this a researchable area is because our scoping study (Yohannis *et al*., 2016) revealed a number of pertinent issues, key among them being that a combination of natural and cultural issues in Kitui County render it a worthwhile study area as far as incorporation of ICTs in relaying livelihood related information for decision making goes. For instance, Kitui County, like many regions in the country, is highly patriarchal, which means that men make the crucial decisions for all, including women. The region further suffers from extreme climatic and weather conditions; when it rains, soil erosion occurs and, during the dry spells, crops fail (Kitui County Government, 2013). Throughout, deforestation takes place due to a complex relationship between poverty, lack of information and the desperation that drives people into a state of fatalism. In all these, the place of women is at once precarious as it is vital; the women remain central to the survival of the communities in material, social, cultural, and economic terms (Aguilar, 2009). Any initiative that aims at uplifting the entire region from the traps of poverty, hunger, and forms of inadequate or inaccurate information needs to target the rural women of Kitui County.

1.2 Access to and Use of ICT among Rural Women in Kenya

The general view is that women in rural Kenya have not fully accessed ICT for use in their daily lives. This is because Kenya has been slow to reform the ICT sector due to various reasons like poverty, socio-cultural barriers, market monopoly, corruption, and under-investment (Waema and Bjastad, 2014). While the problem was more aggravated in the days of landline telephones, the advent of mobile telephony and other tools like the tablet and the Smartphone have only marginally improved the situation. These, coupled with limited infrastructural support and erratic connectivity, have further limited the extent to which rural women can access and meaningfully use ICT tools, especially in their routine endeavors to mitigate against climatic extremes that make life difficult (McOmber *et al.,* 2013). In the case of Kitui County, for instance, the perennial drought and the attendant food insecurity means there is an urgent need to embrace ICT as a way of sharing information on how to formulate new livelihood strategies to overcome the challenges. ICT becomes key in these endeavors. Indeed, in a somewhat related context, IDRC (2005) contends that an acute lack of infrastructure in Kenya severely limits opportunities for using ICTs for economic and social development, which can be measured by such primary indicators as levels of food security. There is the need, therefore, to carry out a study that shows how ICT can be used to bridge the gap between harsh climatic conditions, formulation of livelihood strategies by rural populations (especially women) and attendant forms of social development.

This state tends to affect women in rural areas like parts of Kitui County more than any other population group. This is because challenges like limited educational opportunities affect them more by exposing them to the pangs of patriarchy and other socio-cultural barriers that make it difficult for them to pursue their dreams and achieve their goals. The result is that gender-based inequalities are enhanced because women in rural areas continue to have less income, education, time, mobility, and face religious and cultural constraints that restrict their access to, and use of, technology (Kituyi-Kwake and Adigun, 2008; Denton, 2002:2004). This is not to say that all women in rural areas are faced with the same challenges in the same way or even to the same degree. Indeed, Odame (2005) argues that some groups of women are affected differently because different variables intersect to yield different experiential outcomes. The older, illiterate, poor and rural women are more disadvantaged than their younger, literate, wealthier and urban counterparts. Ballantyne, Labelle, and Rudgard (2000) contend that the use of ICTs among rural women is limited by lack of awareness, skills, training, and a shortage of capital resources for sustainability. There is need to carry out a study that shows how various groups within the larger category of women, deals with the threats and opportunities associated with ICT access and use. The paper, however, should provide for the implications of these variables, where we focus on the intersection between gender and place of residence to see how these two variables can be influenced by ICT in linking climate information and livelihood strategies in rural Kitui County.

1.3 Climate Information and its Relevance among Rural Communities

Climate information refers to all that data relating to amounts and seasons of rainfall, trends in temperature fluctuations, intensity, and direction of the wind, intensity of sunshine, cloudiness, among others. Such information is usually organized in terms of temporal currency or historical patterns (Gunasekera, 2004). For our purpose, our interest in climate information is regarding how it can be used by rural communities to make decisions on land use and other resource mobilization that is aimed at improving rural livelihoods and climate change adaptation. Research shows that such information, if well packaged and appropriate to the farmers' needs, can attain greater acceptance and more influential in decision-making (Cherotich *et al*., 2012; Wamalwa *et al.,* 2016). Other studies include

Kniveton *et al.* (2012), Barret and Ndegwa (2016) whose findings on the enhancement of livelihood strategies in rain-fed dependent economies is relevant to our study. The fact that these studies were conducted in Kenya gives us reason to believe that their findings apply to Kitui County. Hence, we focus on climate information and support services relevant to climate change adaptation in semi-arid areas that include weather forecast, seasonal forecasts, early warning signals, and their corresponding agro-advisories. Weather and climate variability information are essentially short-term and of immediate relevance to rural communities, hence if well packaged they may help in increasing farm productivity and thus improve livelihoods and help farmers adapt to climate change (Cherotich *et al*., 2012).

For a more unobstructed view of the differences in detail and timeliness of different forms of climate information, the Table1:0 below captures the different timescales associated with weather and climate patterns that may relate to the information needs of the rural farmers in Kitui County. Because farmers in rural Kitui County need this information to make decisions that impact on their livelihoods, the critical focus of climate information that they need is that which relates to weather and climate patterns and how these can impact on their productivity and help them cope and adapt to climate change. Hence, accurate and timely climate information enables the farmers to make decisions on the timing of planting and fertilizer application, selection of crop types and varieties that can yield optimum results in the dominant weather and climatic conditions, livestock stocking rates, market trends, and change in farming systems.

Although, considerable advances have been made in the collection, archiving and analysis of weather and climate data, their transformation into usable information by the small-scale rural farmers remains poor. Some qualities are required for such information to be useful to farmers. Tall and Hansen (2013) identify such qualities as:

- *Salience*: tailoring content, scale, format, and lead-time to farm-level decision-making;
- *Access*: providing timely access to remote rural communities with marginal infrastructure;
- *Legitimacy*: ensuring that farmers own climate services, and shape their design and delivery;
- *Equity*: ensuring that women, poor and socially marginalized groups are served; and
- *Integration*: providing climate information as part of a larger package of agricultural support and development assistance, enabling farmers to act on received information as challenges that confront efforts to use climate-related information to improve the livelihood of smallholder farmers.

If climate information can have all these attributes and is properly used by the targeted communities, then it will have the desired effect. For our purpose, we are concerned more with the qualities of access how often and detailed climate information the users can get), equity (bringing in women who have for long been marginalized from economic activities) and salience (urgency and currency or lead time of the climate information), which determines the adaptation of climate information to the prevailing local conditions, in this case tailoring content in the local language. All other qualities remain relevant nonetheless, even though on different scales. All these are further held together by the Sustainable Livelihood approach that informs the overarching interpretative tool. The sustainable livelihood approach, therefore, provides a view that brings community/household-specific and contextual issues to the forefront when considering the application of climate information (Ziervogel and Calder, 2003) and in addition the potential of ICTs dissemination of climate information and agricultural knowledge is reinforced in the next section.

Table 1: Climate Information across Timescales

Term/Timescales	Type of Information	Source of Predictability	Treatment of uncertainty	Medium of delivering Climate Information	Relevance Rural Farmers (Livelihood Strategies)
Weather (Days to Weeks)	• Observed rainfall and temperature • Forecasts for rainfall and temperature for up to one week ahead of time • Alerts on pests and diseases • Early warning of extreme weather events (drought, floods)	Initial atmospheric conditions	**Deterministic**: hourly-daily weather sequences	• Mobile Phones • Radio • Television • Call Centres	• Timing of planting and harvest • Timing of fertilizer, pesticide and irrigation application • Protection lives and property from extreme events
Climate Variability (Months to Years)	• Probabilities for seasonal rainfall and temperature conditions • Seasonal climate variables targeted to particular agricultural risks (dry spells, rainy season, onset and cessation dates, duration of rainy season)	Boundary conditions (ocean and land surfaces)	**Probabilistic**: shifts in probability distribution of seasonal statistics	• Workshops with experts • Conversion with agricultural extension agents (farm educators) • Mobile Phones • Radio • Television • Call Centres	• Selecting crops and seed varieties • Livestock stocking rates and feeding strategies • Intensity of input use (fertilizer, pesticides) • Labor or marketing contracts • Intensifying and diversifying crops • Diversifying sources of income
Climate Change (Decades or longer)	• Projections of future rainfall and temperature • Historical trends in rainfall, temperature, wind, extreme events	Anthropogenic and natural changes in atmospheric composition and heat balance	**Scenarios**: projections of plausible future climate statistics with unknown uncertainty	• Workshops with researchers, • agricultural extension agents and • meteorological services	• Major capital investments (buying or expanding landholding, irrigation systems, farm equipment, etc.) • Changing farming system or livelihood strategy • Deciding whether or not to farm

Source: *Meinke and Stone (2005), CCAF*

1.4 ICT and Climate Information

As noted by Chapman and Slaymaker (2002), ICTs can facilitate the generation of information required by rural poor to make better-informed decisions that affect their livelihoods strategies and ultimately their livelihoods. However, these ICTs must be linked to institutions and external stakeholders that may affect the livelihood of the rural poor, but most importantly, they must be enabled to address the specific needs of the rural poor and be demand-driven.

Ospina and Heeks (2012) assert that there are emerging experiences in rural agricultural communities that show the use of ICTs (such as mobile phones, community radio) in disseminating climate change information to the population. Advances in technology open up new ways in which the same technology may be used. Indeed as the World Bank IEG (2011) writes, "ICT promotes innovation and can trigger a fundamental economic transformation. Individuals are unleashing the potential of their human capital and creativity." One such way is the potential of ICT to

become a strategic enabler of climate and weather information systems by not only providing a platform to scale the dissemination of information to farmers at unprecedented levels, but also do so at the level of localization and temporal specificity that is an important element of effective and actionable weather information vulnerable groups in rural areas (Karanasios 2011). Moreover, this fits in quite well with Bhavnani et al.'s (2008) idea that mobile phones can drive everything from "improvements in social links, the creation of social capital, improved market information flows, and productivity, as well as increases in GDP and Foreign Direct Investment."

Concerning new and emergent technologies, Karanasios (2011) posits that the expected diffusion of mobile broadband opens a range of possibilities for climate change adaptation including capacity building, monitoring, and information dissemination. Similarly, Chaudhury *et al.* (2012) notes that though it has to be determined which types of information should and could be effectively communicated; mobile phones could be used in information exchange. In developing countries, mobile telephony is more accessible than PCs and the Internet, since it is a more cost-effective and simple to deliver information; as a result, increased access to the internet will be via the mobile phones (ITU, 2008). Hence, we believe that mobile telephony, among other ICTs, is an essential component in the broader ICT framework that can be used to link climate information in rural areas like parts of Kitui County as part of initiatives meant to enhance the success of the livelihood strategies adopted as part of the larger journey towards development.

The radio is one of the most useful and largely diffused technologies for reaching the masses, especially, the poor (ITU, 2008). The radio plays an important role in information dissemination. Its advantage is its ability to reach illiterate farmers and provide them with information relating to all aspects of agricultural production in a language they understand (Chapman *et al*., 2003). In addition to being the most effective way to reach farmers, radio programs that provide farmers with climate change information can provide researchers with knowledge of what is happening at the field level and encourage communication between researchers and farmers (Farm Radio International, 2009).

The World Bank, the United Nations Development Programme (UNDP) and other global agencies have identified ICT as, particularly beneficial tools in many areas, including expanding women's roles and mitigating social and environmental inequities (UNCTAD, 2010; 2011). Indeed, ICTs play an increasingly important role in environmental monitoring and in providing relevant information related to natural resource-based livelihood assets and climate-related hazards such as drought (ITU, 2012c; ITU, 2014). ICTs are increasingly being employed to improve meteorological data collection and disaster prediction and early warning, for example. Much of the research linking people, ICT and natural resources are agriculture decision-support projects, such as the Rao, Hubaux and Jamadagni (2007), whose study of the COMMON Sense Net wireless network in a drought-hit cluster of villages in Southern Karnataka (Panchard *et al*., 2007) may find relevance to our own study. Panchard *et al.* (2007) highlight the potential for ICT to help village residents manage crop-risk by efficient use of water and pest prevention, and it stresses the importance of allowing farmers to "connect to and act on the constraints of their environment." Our proposed research has similar objectives because we believe that we can link relevant climate information, using ICTs, with rural women in Kitui County, an area that experiences extreme forms of climatic conditions.

1.5 Sustainable Rural Livelihoods

Chambers and Conway (1992) define livelihoods as "the capabilities, assets (stores, resources, claims and access) and activities required for a means of living", while adding that sustainable livelihood is that which "can cope with and recover from stress and shocks, maintain or enhance its

capabilities and assets, and provide sustainable livelihood opportunities for the next generation; and which contributes net benefits to other livelihoods at the local and global levels and in the short and long term". Sustainable livelihood rose to prominence in the early 1990s, after the challenges associated with famine and food insecurity during the 1980s (Haidar, 2009). Different researchers have since then adopted the livelihoods concept and used it in development discourse. For instance, Chapman *et al.* (2001) demonstrate how sustainable rural livelihoods approach provides a useful framework of situating the rural poor in the context of issues that affect their lives, especially in terms of policy formulation and implementation with regard to access to and ownership of resources, as well as in opening up vistas for the diverse strategic livelihood options available to poor households. In all these, ICTs have been central in packaging and delivering relevant information for both the poor whose lives need to be changed and for the policymakers who should lead in making the desired changes. In this regard, the sustainable livelihood approach has gone beyond being a concept to become an analytical framework.

The review paper is informed by earlier studies elsewhere. For instance, in a study carried out in Uganda, Burrel (2008) demonstrates that mobile phones in rural areas were mainly used to reduce the money spent on transport and other transactional costs of subsistence farming. Other researchers such as Mittal *et al.* (2010) and De Silva (2008) also concur with this view, further adding that reduced transport costs translate into benefits for the farmers who make net gains on other livelihood assets. Overall, farmers who are equipped with ICT-mediated information may be better empowered to enhance their power to bargain in an increasingly competitive and technology-driven market. Based on the sustainable rural livelihoods briefly reviewed, it is important to delve into components that constitute sustainable livelihoods, including livelihood assets (human, social, physical, natural, and financial) and how they relate to climate information, as well as livelihood strategies.

1.6 The relationship between Climate Information, Livelihood Assets, and Strategies

According to DFID (1999), the shape of the Pentagon, Figure 1.0 displayes the variation in people's access to assets schematically. The idea is that the center point of the Pentagon, where the lines meet, represents zero access to assets while the outer perimeter represents maximum access to the same assets. On this basis, differently shaped pentagons can be drawn for different communities or social groups within communities. A single physical asset can generate multiple benefits. If, for example, someone has secure access to land (natural capital) they may also be well endowed with financial capital, as they can use the land not only for direct productive activities but also as collateral for loans. Similarly, livestock may generate social capital (prestige and connectedness to the community) for owners while at the same time being used as productive physical capital and remaining, in itself, as natural capital (Chapman *et al*., 2004).

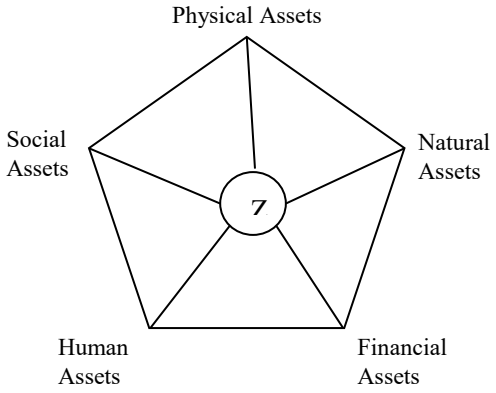

Figure 1: Livelihood Assets Pentagon.

*(**Source**: DfiD 1999)*

On a related place, Chapman *et al.* (2001) argue that ICTs' impact on livelihood assets depends on the local context in which they are introduced. Within the context of the Sustainable Livelihood Approach, ICT interventions facilitate the

provision of information to the rural poor to improve their decision-making abilities. However, core to information is the fact that the information needs are directly related to the five livelihood assets and can be represented by the livelihood information wheel best illustrated by Figure 1.2 representing the Livelihoods Information Wheel.

A at the center represents the core information which contributes to the long-term capacity building for decision making to appropriate livelihood strategies, usually through education and training, and technical support and assistance with problem-solving.

B, on the other hand, represents the information that relates predominantly to the local context and needs regular updates for people to make short-term decisions regarding their immediate livelihood activities. It can also contribute to medium-term diversification and livelihood strategies.

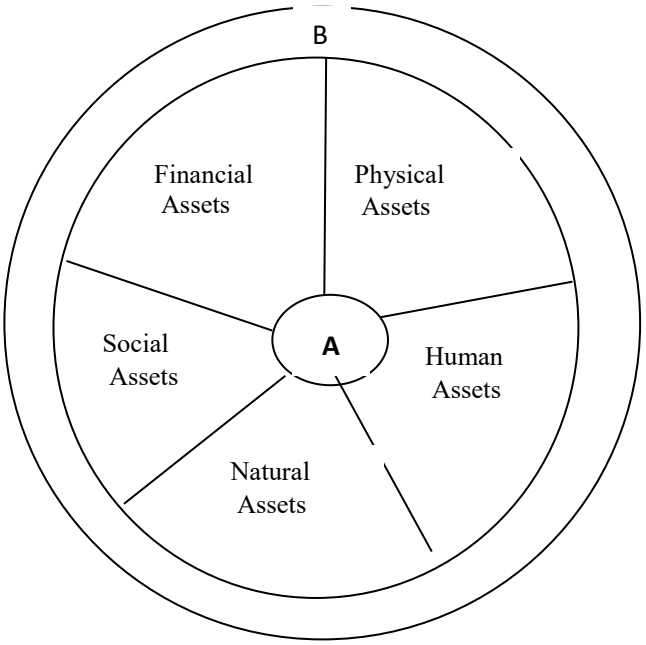

Figure 1.2: Livelihoods information wheel

(Source: Chapman and Slaymaker, 2001)

Chapman and Slaymaker (2002) devised the information wheel model to differentiate between information that affects short-term livelihood strategies and those that affect long-term livelihood strategies. More informed rural people and farmers can use relevant information facilitated by ICTs, to make relevant and timely decisions about their livelihood strategies, thereby reducing their vulnerabilities and increasing livelihood asset diversification.

For instance in **A**, ICT tools such as mobile phones and the community radio can be used by institutions and government to alert and update farmers about pest pandemic or famine. While in **B**, Greenberg (2005) and Richardson (2006) show that the provision of simple information such as weather forecasts and crop information itself has provided livelihood benefits. Farmers use such information to make relevant decisions about livelihood strategies, thereby reducing disaster impact (flood, disease, drought warning, and mitigation), protecting their natural assets, and thus increasing their income diversification, which is tied to the provision of local climate information mediated through ICTs.

Conclusion

The embrace of ICTs, accordingly, may not necessarily be beneficial to all farmers, but only to the market-driven ones. For instance, Bhavnan *et al.'s* (2008) study were based on the common perception by some subsistence smallholder farmers who produced food crops for household consumption only, and who suggested that they did not gain any benefits by using the mobile phones to access and use agricultural information. Our view is that all farmers do gain somewhat by using ICTs in general and mobile phones in particular, given that even those farmers who do not wish to sell their produce may still need to know which market sells inputs at the best prices, and thereby make savings on farm inputs expenditure. It is possible, in our view, that Bhavnan *et al.* (2008) got their responses that way because of how the initial question had been framed. McNamara

(2003) and May (2010) also suggest that too much experimentation with ICTs in the fight against poverty and the promotion of sustainable development has demonstrated the possible advantages of, but also the risks and challenges associated with the same ICTs. Accordingly, there is a tendency to exaggerate the successes associated with ICTs, without paying due regard to the broader contextual influence on the outcomes, for instance, the fact that the initial acquisition of mobile phones is an indicator of improving livelihoods in the first place. This has posed a danger to the sustainability of many ICT-for-Development initiatives because the planners and executors of such initiatives are blinded by their enthusiasm to the broader scope of underlying realities. Therefore, this review paper considers these undeniable facts and recommends the need for evaluating the cause and effect relationship that exists between climate information, ICTs, and the livelihood strategies adopted by the rural community.

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