

**OPPORTUNITIES AND CHALLENGES OF INFORMATION
COMMUNICATION TECHNOLOGY FOR POVERTY REDUCTION IN
ETHIOPIA SOMALI REGION**

MSC. PROJECT

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JANUARY, 2018

HARAMAYA UNIVERSITY

**OPPORTUNITIES AND CHALLENGES OF INFORMATION
COMMUNICATION TECHNOLOGY FOR POVERTY REDUCTION IN
SOMALI REGIONAL STATE ETHIOPIA.**

**A PROJECT SUBMITTED TO DEPARTMENT OF RURAL DEVELOPMENT
AND AGRICULTURAL EXTENSION, POST GRADUATE PROGRAM
DIRECTORATE**

HARAMAYA UNIVERSITY

**In partial Fulfilment of the Requirements for the Degree of
MASTER OF SCIENCE**

In Agricultural Economics and Rural Development

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JANUARY, 2018

HARAMAYA UNIVERSITY, ETHIOPIA

ACKNOWLEDGEMENTS

First and for most, I would like to extend my unshared thanks to the almighty God for providing me with the opportunity for what I have achieved. I am highly indebted to my advisor, Dr YaredMammo for his patience, instructions and constructive criticism given to my work. Despite his busy schedule he always found time for me. I would like to thank various offices or bureaus in Ethiopia Somali Region that allowed me access to all valuable information and documents that I wanted. These include finance and economic development bureau and Disaster prevention and preparedness bureau.

Lastly, I am very grateful to all my family members, especially my wife NimoNuriyeand my fivechildren for their constant encouragement and support aswell as for their understanding particularly during the final year to complete my project work

LIST OF ABBREVIATIONS AND ACRONYMY

AWD	Acute Watery Diarrhea
AISI	African Information Society Initiative
CSA	Central Statistical Agency (Ethiopia)
CIT	Communication and Information technology, FDRE
DFID	Department for International Development (UK)
EI	Education Index
ETA	Ethiopian Telecommunication Agency
ETB	Ethiopian Birr
ESTV	Ethiopia Somali Television
ETC	Ethiopian Telecommunication
FDRE	Federal Democratic Republic of Ethiopia
FAO	Food and Agricultural Organization
GAM	Global Acute Malnutrition
GNI	Gross National Income
GDP	Gross Domestic Production
GSM	Global System for Mobile Communication
HDI	Human Development Index
HHICES	Household Income Consumption and Expenditure Survey
HPI	Human Poverty Index
IFIP	International Federation for Information Processing
ICT	Information and Communication Technology
ITU	International Telecommunication Union
IT	Information Technology
LCRDB	Livestock and Crop Production Development Bureau
MRA	Multi-Agency Rapid Assessment
NGO	Nongovernmental Organization
OECD	Organization for Economic Cooperation and Development

PPA	Poverty Participatory Assessment
PFE	Pastoralism Forum Ethiopia
PADEP	Plan for Accelerated and Sustained Development to End Poverty
PACT	Community Social service Organization Ethiopia, NGO name
SRA	Social Research Association
SRSDPPB	Somali Regional state Disaster Prevention and Preparedness Bureau
SRSCBB	Somali Regional State Capacity Building Bureau
SRSWRB	Somali Regional State Water Resource Bureau
SRBOFED	Somali Regional state of Finance and Economic Development
SRHB	Somali Regional Health bureau
SSA	Sub Saharan Africa
SME	Small Scale Enterprise
SRE	Somali Region of Ethiopia
TB	Tuberculosis
TV	Television
UNDP	United Nation Development Program
UNESCO	United Nation Educational, Scientific and Cultural Organization
UN	United Nation
UNDP	United Nations Development Program
WB	World Bank

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ABSTRACT

ICTs has a positive impact on the living conditions of rural and urban societies if it used in appropriate and utilize to the maximum extent. This study is, therefore, focused on exploration of opportunities and challenges in using Information and Communication Technologies (ICTs) for poverty reduction. The objective of the study includes Identifying opportunities of using ICTs in poverty reduction in this region, Exploring challenges of using ICT in poverty reduction and Suggesting ways in which ICTs could be used in poverty alleviations. The methodology implemented to achieve the objectives was analysis of literature pertinent to ICT for poverty reduction using various literatures to cross check and ensure the trustworthiness of data. The study evidenced that the existing relationship between application of ICTs and poverty reduction looking for many aspects that has direct and indirect benefit with ICT. Despite the study addressed many challenges for using ICT in relation with poverty reduction, such as, electricity, literacy, education, and affordability because the ability to access new user technologies will depend on the level of growth that can be sustained within individual economies to raise incomes among consumers and generate the necessary investment. As a result, the effect of these interventions in addressing the opportunities for ICT in Somali region is very significant. Therefore, it recommends that policy adoption to develop ICT and use of serving the society in different perspectives. However, the study found the main challenges of using ICT I is literacy. in this regard, adult education and alternative basic educations in the region should be strengthened in order to lift out from poverty and allow them to use ICT for their daily activities, such as information sharing and marketing emphasising to introduce Somali language software's for their mobiles that enable them for reading and writing it also recommends expansion of hydroelectric power across the region that will allow economic growth and creation of small scale enterprise to rise. That can be sustained within individual economies to raise incomes among consumers and generate the necessary investment public and private in national network

1. INTRODUCTION

1.1 Background

As many businesses have now moved from manual methods to the use of ICT for processing data. The benefit of ICT is holistic that can be used socially, economically and politically to positively change the living conditions and alleviation of poverty, using ICT effectively will enable society to facilitate sharing of resources, expertise and advice with greater flexibility when and where tasks are carried out (UNESCO, 2002).

A study made by Yin (2005) recognized that ICT distribution is highly correlated with the demographic characteristics including age, gender and marital status of an individual. According to his argument, gender affects the application of various ICTs in a way that 10 males are more likely to use ICTs than females. In terms of education ICTs are a potentially powerful tool for extending educational opportunities, both formal and non-formal, and ICT can increase productivity and promote conducive teaching and learning environments (UNDP, 2011). The impact of improved ICT access on farm earnings through increased knowledge of market prices will be muted if there are no roads to carry crops to markets, or there are no markets because of an unreformed agricultural sector. (World Bank, 2001).

The use of ICTs in poverty reduction, therefore, does not end once information is transmitted. It needs to look at an individual's or a community's livelihood as well as their perceived needs and determine which information is relevant to poverty reduction (DFID, 2004). Access to information technology is essential for the emergence of global information and knowledge based economy and has the ability to empower poor communities, enhance skills, and link various institutions involved in poverty reduction (Janakiram, 2007).

Notably, previous works recognized the role of efficient distribution and application of ICT goods and services to improve the living condition of rural societies in different viewpoints. Among them, the report made by IFIP (2007) revealed that ICT's have been playing a great role in promoting agricultural development through better access for technical and input related needs through provisioning of knowledge and technology and strengthening dialogue between and among farmers and farm linked institutions in rural areas. Correspondingly, (Stienen, 2007) supposed that application of ICT in rural areas widens market access through provisioning of up-

to-date information on prices of commodities, inputs and consumer trends which advances farmers' livelihood. This perhaps shows the potential role of various ICTs in rural areas.

In this regard, the work made by James (2007) argued that the existing poor transportation and communication outlets limited provisioning of basic health services for societies residing in rural and remote areas especially on times of emergencies needed.

In addition, by providing access to information, making markets more efficient, fostering social inclusion, equalizing opportunities in rural areas, ICT offers an innovative and unprecedented tool to directly reduce poverty (Barton, 2000).

The multidimensional nature of poverty makes calculating poverty a very challenging task, not least as a result of problems in weighting different components (ITU, 2010). In spite of this, the current UNDP's HDI is widely used in measuring poverty. HDI considers three key aspects of poverty indicators including education, health and per capita income status of a certain societies (ITU, 2009).

Information and communication technology is a tool for socio-economic development and poverty reduction strategies. Access to information and communication technology has a positive impact of the alleviation of poverty and in general living condition of any society (UNDP, 2010). ICT can facilitate speedy, transparent, accountable, efficient and effective interaction between the public, citizens, business and other agencies. This not only promotes better administration and better business environment, but also saves money in costs of transactions in government operations (IICD, 2001)

The Somali region is one of the nine regional states that constitute the Federal Democratic Republic of Ethiopia, the region consists of nine zones, 93 districts which further divided into 713 Kebeles the Somali region still lacking the basic services of ICT implementation despite all progress stepped up the countries (SRSCBB, 2009).

1.2 Statement of the Problem

Nowadays ICTs became the back bone of the economy in which many businesses have now moved from manual methods to the use of ICT for processing data. In Somali Region illiteracy, income and employment remain very poor as well as weak technical and institutional development (DFI, 2010). However, the Federal government has placed enough emphasis on the promotion of telecommunication and internet services across the countries but Somali Region still lacking the full use and wide coverage of ICT (EITPA, 2015).

Evidence shows that technology is not a goal in itself, but a means of achieving development goals and poverty reduction tools (Bhatnagar, 2000).

ICT application in Ethiopia is among the lowest one in the world despite the current encouraging infrastructural expansion which is expected to improve the situation. For instance, the country is at the rank of 154 from a total of 159 countries in the world with ICT development index of 1.03 (ITU, 2010). Consequently, Somali Region is among the lowest in the countries for ICT applications in relation with poverty reduction (EITPE, 2015).

Lack of available information communication schemes in rural areas and poor transportations and communication outlets affected many rural households to remain in poverty, hampered timely response on emergencies in Somali region (RHB, 2016).

60% of the total land of Somali region have no telephone access, Somali region affordable access to relevant information and knowledge services among the rural poor has been a concern (Meher assessment, 2015). In Somali Region ICT is not an area that has been well-integrated in rural and urban poverty reduction often narrowly defined as modern technologies (e.g., computers & the internet) and the more traditional technologies (fixed line telephone, radio & television) have not yet themselves been fully exploited (BOFED, 2014).

The role of ICT in poverty alleviation have not been clear yet in the region as key of socio – economic development, because low education attainment and gender inequality and lack of access to ICT made them less able to cope the ICT. In addition to this, information flows is very low and not widely accessible in Somali Region which hampered markets and government institutions to be efficient, transparent and accountable in every sector. According to (SRSCB, 2009). Therefore, assessing the use of the existing ICT in poverty reduction is very important

1.3 Objective of the Study

The overall objective of the study was to investigate the opportunities and challenges of ICTs for poverty reduction in Somali regional State of Ethiopia.

Specifically, the study attempted to:

- Identify opportunities of using ICTs in poverty reduction
- Explore challenges of using ICT in poverty reduction
- Suggest ways in which ICTs could be used in poverty alleviations

1.4 Study Questions

The study answered the following research questions

- What are the Opportunities of ICTs for poverty reduction?
- What are the challenges of ICTs for poverty reduction?
- How could ICTs be used in poverty reduction?

1.5 Significance of the Study

The research is expected to provide significant outcomes to the readers in different outlines.

These include:

- Source of information to those institutions who want to get involved in the activities of policy making or implementation.
- Development of methodology concerning studies on the role of ICTs for poverty reduction rural improvement.
- Provides a solid document that might be used as a source of information on ICT in relation with poverty reduction

2. LITERATURE REVIEW

2.1 Some Basic Concept

2.1.1 Definition of Poverty

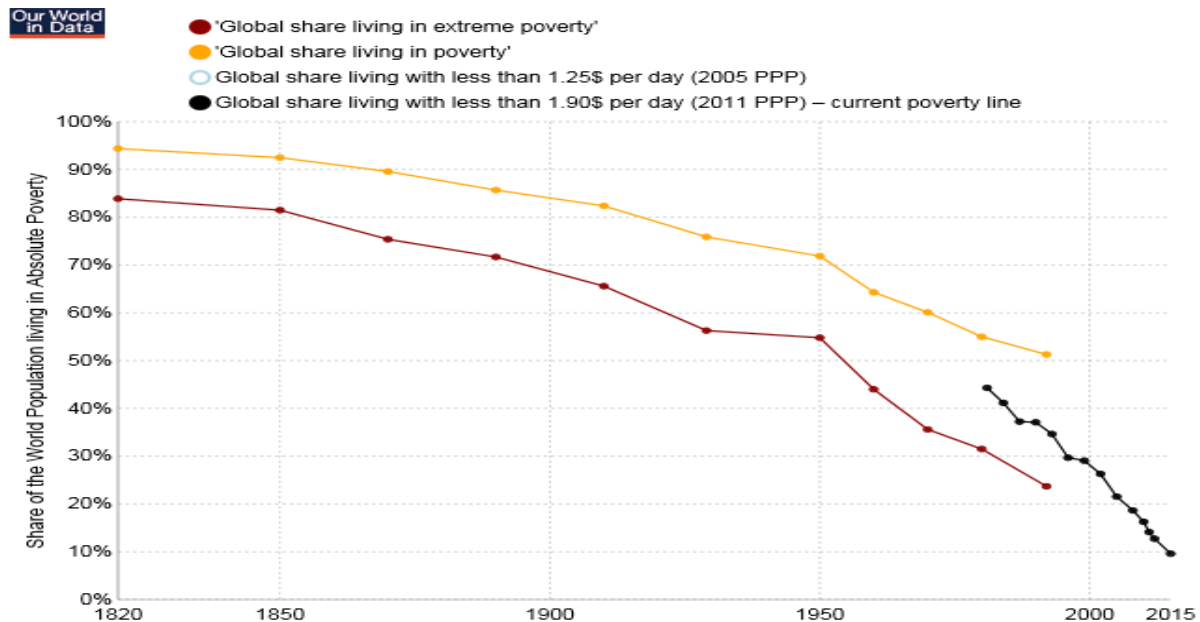
Poverty describes the condition that person or community lives (PPA, 2011). However, there is no universal definition of poverty accepted by all countries. Poverty varies between socio-economic activities and it is a multidimensional concept which includes a lack of material well-being, voiceless, powerlessness, and absence of basic infrastructure, and lack of possession or assets

(World Bank, 2011). Around the world, in rich or poor nations, poverty has always been present. In most nations today, the gap between the rich and the poor is quite high and often widening. Many feel that high levels of inequality will affect social cohesion and lead to problems such as increasing crime and violence.

Abigail (2015), defined poverty as the state of one who lacks a usual or socially acceptable amount of money or material possessions. Furthermore, almost half the world over three billion people live on less than \$2.50 a day and at least 80% of humanity lives on less than \$10 a day (UNDP and world bank, 2015).

The World Bank data has published data on absolute poverty for 1981 to 2015 showing that in 1981 more than 50 % of the world population lived in absolute poverty – this is now down to about 14% this is still a large number of people, but the change is happening incredibly fast. The data tells us that poverty is now falling more quickly than ever before in world history. The first of the Millennium Development Goals set by the UN was to halve the population living in absolute poverty between 1990 and 2015.

Figure 1 Declining Global Poverty, 1820-2015 – Max Roser



Source : (World Bank, 2015).

2.3 Types of Poverty

2.3.1 Absolute poverty

Absolute or extreme poverty is when people lack the basic necessities for survival. For instance they may be starving, lack clean water, proper housing, sufficient clothing or medicines and be struggling to stay alive. This is most common in developing countries (WB, 2013).

2.3.2 Relative poverty

Relative poverty is when some people's way of life and income is so much worse than the general standard of living in the country or region in which they live that they struggle to live a normal life and to participate in ordinary economic, social and cultural activities (WB, 2013).

2.4 Information and Communication Technology

Information and communication technologies can be defined a diverse set of technological tools and resources used to communicate, and manage information. These technologies include

computers, the Internet, broad casting technologies (radio and television), and telephones (Kramer *et al*, 2007).

The term ICT has broader meaning and different authors defined it in different ways. Although many of them elaborate the term using multiple approaches, their main theoretical narration confined to similar angle where knowledge is a subset of information exchanged among human being. One of the classical definitions of knowledge which was forwarded by a known philosopher Plato enlightens the term as an infallible and unlike belief it is directed to an immutable object (Pohjola, 1998). Importantly, there are convincing thoughts developed in recent eras concerning what knowledge is and how it could be acquired by human being. Knowledge as a correct sense of the word know which is implicated by others sense of the word. He argued that one must be able to tell whether one has correct information or not in order to engage in experimental enquiry test and scientific rationalization (Panos, 2008). Possibly, this is an indication for the real connection between knowledge and information. In reality, the possession of correct information is not sufficient condition to gain knowledge rather it should become useful and convertible in to reasoning.

On the other hand, the word information comes from the amalgamation of meaningful data which can be stored and disseminated (Phil and kery, 2000).

Principally, information has its own source, the way how it can be transmitted and the final destination where it reaches. In this regard, overall quality and relevance of information is influenced by the channel where it exchanged at a given point of time. This perhaps suggested that the amount and quality of information is highly determined by the prevailing ICT's as they are the tunnels where information is flowing and exchanged.

Moreover, it is believed that source of knowledge is related to the effective use of available information where communication technologies play great role in disseminating information from the source to the destination (Kramer *et al*, 2007).

2.5 Information Communications Technology for Poverty Alleviation

Access to ICTs has a positive impact on the alleviation of poverty and in general living condition of any society. There are direct relationship between ICTs and poverty alleviation at HHs level. Accessing ICT will improve the living standard and generally enhance the economic growth of

the country, in this regard ICT have direct and indirect impacts on growth and poverty alleviations (ITU, 2009).

2.6 What are the Opportunities of ICT in relation with poverty reduction?

2.6.1 Direct Benefit

Direct impacts of ICT on poverty reduction take several routes. First, there is the educational aspect. Information and knowledge enable the poor to understand their own circumstances and to voice their own opinions and needs. ICTs such as radio and television have been effectively used in many countries to reach students in poor rural areas. The Internet provides a virtual classroom in which intense interactivity and the sharing of resources and information take place. The second important impact is on health. The ITU (2009) observes that the most immediate and visible impact that the internet can have in the poorer parts of the world is on the volume and flow of medical information. The third area of impact is productivity and income generation. ICTs give micro and small enterprises access to market information (faster and cheaper than printed material), input prices and output markets and it may strengthen forward linkages to the market (Van Crowder, 1997).

2.6.2 Indirect Benefit

The ITU (2009) considered the indirect impact of ICTs on development have drawn a distinction between ICT consumption and ICT production (investment in information infrastructures, including telecommunications, hardware and software production). Production of ICT goods and services has contributed significantly to the economic success of many Asian countries. Evidence of the benefits of investments in information infrastructure appears conclusive, particularly for telecommunications. The economic benefits of telecommunications – especially voice and fax communication for business – are considerable for individual small and micro-scale businesses in market environments. (Grameen and Duncombe, 1999). Conversely, studies suggest that lack of accessible and affordable communication services are inhibiting the transmission of market information, preventing interaction between producers.

Overall, research has concluded that for developing countries benefits from ICTs are more likely to accrue from consumption rather than production (Duncombe, 2000). This is particularly true

for poorer countries where the ability to use ICTs can dramatically improve, even in the short run, the capability of firms to face competition from developed countries. Conversely, there are thought to be fewer advantages for latecomer countries to develop indigenous ICT production, which requires large capital investments and specialized skills (Pohjola, 1998). Significant productivity benefits for individual firms and economic sectors through investment in ICTs have been demonstrated for exporting firms in less developed countries and for other modern sector enterprises that do business across national borders.

2.6.3 Intangible Benefits

One of the main intangible benefits of ICT in relation with poverty reduction is to increase social cohesion, allowing social networks to vastly increase. ICT and mobile phones can additionally play an important role in disaster risk reduction and emergency situations for poverty reduction and loss of property, while also being an efficient means of providing health information and education. The wide ranging applications, touching on many aspects of life, can therefore act as catalysts for further change and development (ITU, 2011).

2.8.4 Improvement of Rural life

75% of developing countries' population live in rural areas, and of these the vast majority are small-scale farmers, who contribute significantly to the economy yet remain as the poorest (Bhandari, (2011)). If this is to improve then knowledge and information are critical, according to Muriithiet *al.* (2009), and should be included in any poverty alleviation program. Penetration of mobile networks into these rural areas is of concern. As the urban centers approach saturation it is the rural areas that could provide substantial opportunity for growth and hence profits

2.6.4 Farmers Opportunities

Small and medium size enterprises (SME's) are major sources of productivity and contribute a significant percentage of employment and poverty reduction in developing countries (Melchioly, 2010). Fixed line or mobile phones allow SME's to communicate without the necessity of going in person, thus enabling much greater efficiency of their production for timely purchase and deliveries of goods and services.

For farmers, access to information is vital, for without sufficient information a person is unable to make an informed choice and is open to exploitation. Typically, farmers will need information on seed and fertilizer availability, followed by climate data so that planting or preparation can be carried out in a timely fashion. Rural market prices can vary, so in order to get the best deals up-

to-date information is necessary. Remoteness of farms makes the laying of fixed lines impractical and expensive. It is therefore word of mouth and face to face contact that is the means of communicating, such as through extension services or farmer institutes which play a vital role in rural life (McBriarty, 2011).

2.6.7 Economic Growth

While fixed line, internet, and mobile phone subscribers, have gone from being equal in 2002 to twice as many by 2010 (Bhavnani *et al.*, 2013), and since 2013 have doubled again to the present where over 5 billion people own a mobile phone (Bhavnani *et al.*, 2013, GSM World, 2013). Bhavnani *et al.* (2013) state that this phenomenal growth has been driven mainly by private sector investment, assisted by favorable enabling conditions and regulatory environments. The mobile phone industry, therefore, is able to be fast moving and responsive to technological advancements while increased their output through online purchase to minimize cost transactions.

Increased rate of technological improvements. Changes in ICTs over the past 20 years have encompassed two important trends: the exponentially increasing volume per unit amount of information that can be transmitted and stored and the rapidly declining per unit costs of doing so

Commoditization of information: Information and knowledge can now be produced, copyrighted and sold worldwide in the same method as any other consumer good. This has also increased the value of intellectual capital to firms.

Reduced transactions costs: Through the use of ICTs, information content can be separated from its physical location. In addition, new ICTs allow information goods, such as software to be replicated with minimal marginal costs

Increased access to new customers and clients: The internet can lower barriers to competition by increasing the chances that a company anywhere in the world that develops a better product, process, or organizational structure can get into the market, win bids, sell products, and exert pressure on other competitors to improve productivity

2.6.8 Social Capital and Social Cohesions

In societies where information flows widely and access to communication services is widespread, markets and government institutions are likely to become more efficient, transparent and accountable. The institutions and organizations that serve the poor and defend their interests

can be more effective. Information and knowledge that are vital to the poor can be more easily and widely accessible. On the basis of that information, and with tools to communicate with others, the poor can make their own choices, voice their opinions, demand their rights and have more power over their own lives. Increasing communication and the flow of information and knowledge in ways that benefit the poor is therefore a critical component of poverty reduction and sustainable development (DFID, 2015).

2.6.9 Entrepreneurship and Job Search

Mobiles, internet, reduce the cost of running a business and may even enable a user to start one. In China, a study conducted by Sharon, in 2013 found the live-in housekeeper, who was more or less an indentured servant until she got a cell phone, so new customers could call for her services or the porter who spent his days hanging around outside of construction sites and department stores and hoping to be hired to carry other people's loads, but now can go only where the jobs are (Sharon, 2013). In Pakistan, many women have been able to start small businesses for the provision of beauty and hairdressing services, without the need to incur costs of setting up beauty salons. In Thailand, taxi passengers can share the cost of hiring a cab and the mobile is being used to agree time shares (WB, 2014).

2.7 Barriers of Using ICT's by Rural Households

Gender in Equalities

Gender inequality for access derives from the relatively higher levels of illiteracy among the female population and from the lower level of female participation in the formal economy. In most developing countries the vast majority of the female labor force remains confined to rural areas partaking in predominantly subsistence agriculture, while men tend to dominate in industrial and service-based employment. Women have a number of relative disadvantages compared to men that inhibit their access to ICTs including the competing demands on their time both as homemakers and workers (Guerrieriet *al*, 2011).

Affordability

For ICTs to become relevant for poverty reduction they have to be affordable. Over the long term, ICTs are expected to become cheaper, the ability to access new user technologies will depend on the level of growth that can be sustained within individual economies to raise incomes among consumers and generate the necessary investment (public and private) in national networks(Grameen, 2011).

3. MATERIALS AND METHODS

3.1 Methodology

The methodology implemented to achieve the objectives was analysis of literature pertinent to ICT in relation with poverty reduction. To analyse the opportunities and Challenges of ICT for poverty reduction, various theories were used as frameworks. The analysis was identified considering the different factors that allow the ICT to play vital role in poverty looking different perspectives.

3.2 Methods of Data Collection, Analysis and Source

Information and communication technology is a tool for socio-economic development and poverty reduction strategies. Access to information and communication technology has a positive impact of the alleviation of poverty and in general living condition of any society (UNDP, 2010). The study, therefore examined various the role of ICT in poverty alleviations,

This study is based up on secondary data. It used various published and unpublished literatures including government and non-governmental reports that throws light on ICT for poverty reduction in Somali region. In addition to local literatures, the data were used from research and analysis of ICT in relation with poverty reduction in other African, Asia and Latin American countries. To mention some, Ministry of information communication technology, Ethiopia information technology professional Associations, and preparedness Bureau, Bureau of Finance and Economic Development report, various books, workshops and research reports were among the literatures used as source of data.

The data generated within secondary data may not be more context dependent to this study. Attempts were made to use data that have direct relevance to ICT in relation with poverty reduction. Various literatures were used to cross check and ensure the trustworthiness of data. Sources that do not have internal and external consistencies were not used in this study.

4. RESULT AND DISCUSSIONS

4.1. Study Area Context

4.1.1. An overview of Physical Situation

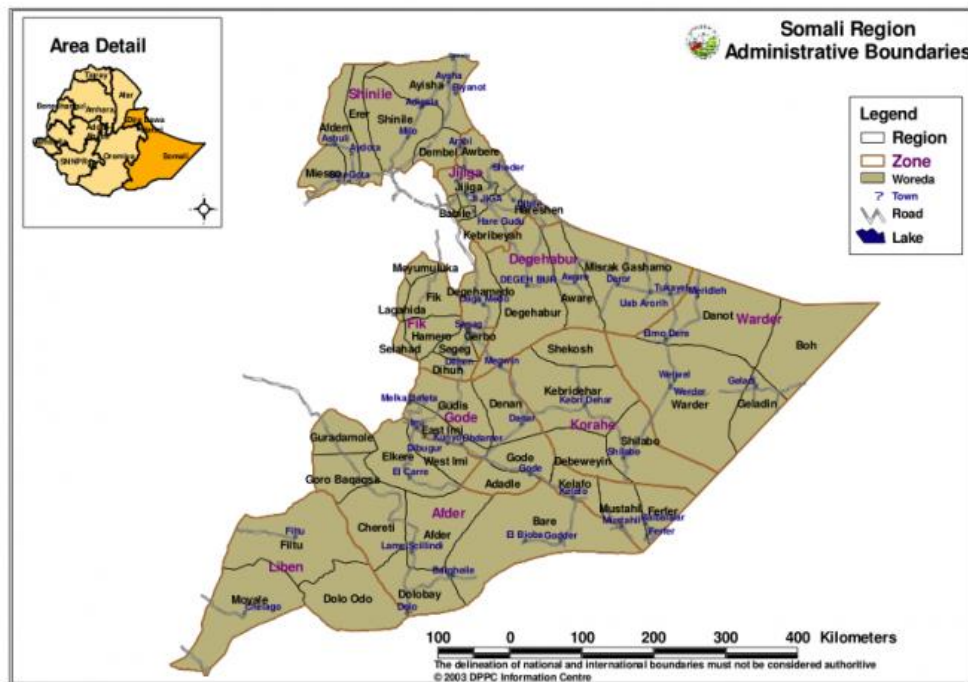
Ethiopia, officially known as the Federal Democratic Republic of Ethiopia, is a landlocked country in the horn of Africa and the 3rd most populous in Africa with more than 80 million people (CSA, 2008)¹². The capital city of the country, Addis Ababa, is also the head quarter of the African Union. Apart from its status of being the only African country to retain its independence through the colonial period, it is also one of the most ancient nations in the world. Ethiopia shares a border with Kenya to the south, Somalia to the east, Eritrea¹³ and Djibouti to north, and Sudan to the west. Ethiopia consists of nine states and two administrative councils with their own administrative structure under a federal system. There are about eighty-four indigenous languages from which Amharic was chosen as the national language since many people can understand it throughout the different regions in the country, though regional states also use their local languages for administrative purpose.

The Somali region is one of the nine regional states that constitute the Federal Democratic Republic of Ethiopia and is the case study area for this research. It is located in east and south-eastern part of Ethiopia bordered in the east and south-east by the Republic of Somalia, in the north by the Republic of Djibouti and Afar Region, in the south by Kenya and in the west by the Oromia Region. The Somali Region is the second largest Regional State in Ethiopia with an approximate area of 350,000 km² and lies between 4 and 11 degrees N latitude and 40 and 48 degrees E longitude (Regional Investment Bureau, 2010).

The state of Somali is known for its livestock resources from which most of the Somali people earn their livelihood. The region is estimated to have about 15.2 million domestic animals out of which sheep constitute for 53% (nearly 8 million in number). Goats and cattle are the second and third most important domestic animals in the State accounting for 20% (3.1 million in number) and 15% (2.3 million in number), respectively. Camels are actually the most important animals in the day to day life of the pastoralist Somali people, and they constitute for about 9% (1.3 million in number). Livestock is a major source of livelihood base for the population of Somali Region. The Region is estimated to have 23.6 million heads of livestock comprising of cattle (20%), sheep (33%), goat (36%), camel (10%) and equines (1%). Improving livestock

productivity and production is crucial to accelerate growth, ensure food security and expand agricultural export (USAID, 2015).

Figure 2 Map of Somali Region.



4.1.2 Climate

The Somali region has an arid (dry) and semi-arid climate. The region is hot in most of the year. According to National Meteorological service agency data indicates that temperature variability throughout the year is relatively low. Minimum temperature ranges almost 7°C and Maximum temperature ranges 36°C , the mean annual rainfall ranges from 700MM to 900MM. The agro-climatic condition of the district is favourable for growing diversified types of crops and different species of animals. Agro pastoralist is a dominant production system in the study area.

4.2 Opportunities of ICT for poverty Reduction

4.2.1 Disaster Relief

InfoDev.(2005)analyzed the value of the mobile phone as a fixed identity point, which can immensely valuable to populations that are constantly on the move displaced by drought, floods, wars or weak economies in terms of, not just enhancing business opportunities, but also keeping in touch with one's home community, either in an emergency or more everyday basis.

Deloitte (2008) offered a specific example. In 2007, during severe flooding in Indonesia, was able to identify all its subscribers in Malaysia that were registered as being immigrants from Indonesia and offered them free airtime. Mobile operators have also been active in disaster relief efforts in Pakistan and Thailand, providing emergency-related communications infrastructure and tools can enhance households to resist shocks and allow the poor households to mitigate the hazards that are threat to their livelihoods and assets (Deloitte, 2008)

In Ethiopia, flooding usually takes place at the peak of the *kiremtrain* season (July and August) in most flood-prone areas. In Gambella flooding often occurs during August and September. In Somali region, heavy rains in the neighboring highland areas of Oromia usually cause flooding during the *kiremt*season. Unseasonal and above-normal rainfall during October to January could also cause flooding in areas along Wabe Shebelle and Genale rivers in Somali region (FTS, 2016).

Given the geographical location where excessive rains from highlands of neighboring Oromia overflow major rivers in the region. Floods result in property loss, displacement and damages to infrastructures at times of excessive and heavy rains in the region. During 2017 *kiremt*season, it is estimated that an average of 363,606 people was affected by flood in Shabelle (Kelafo, Mustahile, Ferefer, Gode, Berano, Addile, East. Imy, and Danan), Afder (West Imy, Chereti, Dollo Bay, Hargelle, and El kari), Korahe (Kebridehar, Debewieyne, and Shellabo), Liben (Dollo Ado), Doolo (Warder), Fafan (Jiggiga, Togwajale and kabribayah), Siti (Afdem, Ayisha, Erer, Miesso, Hadigala, and Shinille (NDRMC, 2017).

Therefore, Somali regional flood task force have taken appropriate mitigation and preparedness measures through ICT to minimize the likely adverse impacts in flood prone areas through application of flood management mechanisms (structural and non-structural measures). In this regard the ICT has played big role to save lives and raise awareness through media and SMS raising awareness of communities to develop self-resilience systems through government structure and community media that allowed many households at risk population to higher grounds. Activities include dissemination of flood alert messages and continuous monitoring updates (RFTF, 2017).

If the poor people residing riverine areas didn't get information through ICT many people would have remain poverty after destruction of their livelihoods and assets. Therefore, there is strong relationship between the ICT and disaster preventions to reduce poverty factored by flood, Information and communication technology is a tool for socio-economic development and poverty reduction strategies. Access to information in relation with potential hazards is very important.

4.2.3 Livestock Marketing

In pastoral areas, the contribution of mobile phone network to livestock has been acknowledged and researchers suggested that great benefit accrue to traders rather than herds (Sede, 2101).

Transmission of market information allows merchandise in pastor areas to improve the timing of purchase and deliveries (Barret, 2003). For instance traders in Ethiopia communicate each other and their agents using mobile phones to obtain sales and price information's while large scale export traders in central Ethiopia also frequently rely on mobile phone and internets.

The ICT has significantly improved the lives of Ethiopia farmers to adopt a new form of agricultural technology through ICT such as, improved seed and frequent contact for ant pest agents through phones (Asfaw, 2011).

The marketing milk from pastoralist areas also has benefited from mobile phone and SMS technology, despite the geographic coverage of mobile networks, the recent studies shows that mobile phone services are not really extensive in pastoralist areas as in crop agriculture region, particularly in Ethiopia. Aklilu (2010) for example, argue that if improvements could be made to communication infrastructure would allow pastoralist to more effectively participate in markets, where these communication services and infrastructure are available, the impacts on herders and livestock trade generally are positive, communication infrastructure expansion specially mobile

phones has significantly reduced the poverty of pastoral areas to obtain good information on their livestock market, pastoralists sell their herds when the market is in favor to them to avoid loss and increase number of sells in order to exchange goods and services (Tadese, 2015).

In Somali Region Livestock is source of food, cash and wealth in pastoral areas. Livestock production is the mainstay of the region. According to BoFED (2014) GTP progress report, animals are the region's principal source of subsistence, providing milk, meat and cash income to cover family expenses for food grains and other essential consumer goods. Somali ranks fifth in livestock resource ownership in Ethiopia.

Associations of camel milk traders and meat exports are dependent on mobile phone to organize the collection of milk supply from pastoral producers for export to neighbouring Somaliland and Gulf States for camel meat export. This has affected many rural communities to uplift poverty (Aklilu, 2011).

Although the mobile phone have not replaced the customary practice of travelling to the livestock market, it reduced the initial cost of obtaining information and allows pastoralists to obtain good information before travelling to the market, in addition to this Somali ESTV become the sole sources of livestock market price in the region where pastoralists are well-connected the information related with price through their friend that have access a television (SRLRD, 2014)

4.2.3 ICT Application by the Institutions for poverty reduction in the Region

It is vital to include institutions involving on developmental activities as they are the main actors of poverty reduction. In this regard, the collected data in Somali Region on the application of ICT showed that agriculture, education and health sectors are comparatively at lower stage. For instance, even at a national level only 29 agricultural centers are connected with the federal government through a national project known as *Agri-net* (ITU, 2009). Similarly, 668 high schools are linked with the *school-net* project which provides education throughout the country relying on the application of satellite television (ITU, 2009). Regarding, health centers, similar project was launched aiming to link regional hospitals and introducing telemedicine throughout the country (Adam, 2010).

Therefore, in Somali region Belga assessment report in (2010) showed that the region has 9 high schools that are linked with the school –net through satellite television that allowed many

students to score higher grade to enter national university, improved their language skills, and increased the schools attendance rate (BelgaAssessment, 2010).

Basically, the overall mission of these institutions is to focus on serving the societies in different perspectives. In this regard, the key beneficiaries include farmers, students that will have impact the society development and uplifting poverty in many families in the long run. This indicates, efficient use of ICTs can be used as a bridge for exchange of information among internal or/and external customers.

There is a strong correlation between access to education and knowledge with ICT, particularly for girls and women, and such key poverty indicators as infant mortality, family size, and women's health. In poor communities, the scarcity of trained local personnel (teachers, health workers, agricultural extension workers) and the impediments they face in accessing vital information and enhancing their skills, perpetuate the low educational attainment and poor health of these communities and makes them less able to cope with new challenges such as AIDS, drought, or natural disasters(Wondmagegn, 2011).

4.2.4 Giving the Poor a Voice

The expansion of private sector ICT capability is unlikely to sufficiently assist the very poor. NGOs and other donor funded support structures will continue to play a role in reaching the poor and giving the poor a voice. However, for ICTs to be made relevant to peoples' lives, initiatives should become more community. based on ggovernments agree that good telecommunications and broadcasting services can foster regional trade and improve integration into the global economy as well as regional economy (Abigail 2015). The ability of ordinary people to communicate with each other also helps promote democracy, good governance and voice of the poor people (AISA, 2002). Information communication can help poor people to rise their voice and transmits their demand to the authority on timely (Baker, 1997).

In Somali Region, the radio is the predominant communication and transmission tools a survey conducted ESTV on (2017) in Godeworedas concluded that the radio has changed the lives of poor and in general the riverine areas for communicating and disseminating information in relation with their product. The farmers in riverine areas have reacted "Before, we listened to the radios of foreign like BBC and VOA butnow we can keep up to date with what is happening here

and put announcements on radio to tell and rise our voices and inform to the local authority most needed in our rural areas. Positive change is also happening at a personal level. Radio projects bring opportunities for community members to learn new skills, thus improving prospects for employment at commercial stations, Traditional birth attendants are taking more precautions because they have heard on the radio that safe practices will prevent infections during delivery (RCCB, 2017).

The idea of accelerating development by using both older media such as radio and newer information and communication technologies has gained momentum in the region establishment of ESTV and radio FM in big cities like Gode, Degahbur and Kebridhar enabled many rural households to connect to the government planning development, while mitigation and prevention of disease outbreak such as measles outbreak and the spike of acute watery diarrhoea in the region used for media outlet and FM to reduce the cases fatality rate in the rural areas and took precaution measurement(RCCB, 2017).

4.2.5 Education& Health

Mobile services are being used to disseminate locally-generated and locally-relevant educational and health information, in order to target rural communities, whose populations are typically have low levels of education and income and would not otherwise benefit from such information. There is evidence to suggest that this type of benefit could save lives in rural communities, The region has tremendously used the mobile phone one of the tools to save lives in the rural areas during the outbreak of AWD and drought induced internal displacement people in 2016 to connect to the local authorities to inform the movement of the people as well as AWD pocket areas in which each and every hot spot villages was given post- paid phones to contact the nearest hospital in cases critical patients of AWD affected is seen (MRA, 2016).

4.3 Challenges of ICT for poverty Reduction

4.3.1 Electricity

It may be argued that the natural barriers in developing countries, such as lack of electricity, will act as constraints to ICT development. However, such barriers can be the stimuli for ingenious solutions and new income generating opportunities. In Tanzania, for example, communities collect together mobile phones to take to a neighboring village to charge. Elsewhere, services to charge mobiles using car batteries have been created (Bhavnani, 2011).

When it comes to Ethiopia Somali region, the proportion of the zones that have regular access to electricity is very minimal comparing to the rest of the countries. Shortage or lack of access to electricity is not only deprives people of such basic necessities as lighting and communication and constrains their access to social services, but also hampers productivity and economic development. Without electricity, activities are limited to daylight hours. Access to electricity can free large amounts of time and labor and promote better health and education.

Table 1 Somali Region zones for Electric power access

S/No	Name of the zones	Type of electric power	Running hours	Remarks
1	Fafan	Hydroelectric power	24/7	Constant power
2	Siti	Hydroelectric power	24/7	
3	Nogo	Hydroelectric power	24/7	
4	Erar	Diesel electric power	6 hour	Frequent Interruption
5	Jarar	Diesel electric power	7 hour	
6	Dollo	Diesel electric power	7 hour	
7	Shabele	Hydroelectric power	24/7	
8	Afdher	Diesel electric power	5 hour	Every day
9	liban	Diesel electric power	6 hour	frequent interruption
10	Dawa	Diesel electric power	7 hour	Every day

Sources: (BOFED, 2015)

As it can be observed from the above table, the number of zones that have hydroelectric power is five zones out of 11 zone in the region. Access to electricity is paramount for the use of ICTs and key for the development of businesses in the region and country at a large. Those zones that have 24/7 electric power like Fafan and Shabele has more employment opportunities than those haven't because many small scale enterprise are operational in the areas to create jobs and generate income. Therefore, it is hypothesized that ICT use status has strong and directly relationship with the access to electricity.

4.3.2 Language/literacy

As with any form of communication, language is critical. Expansion of ICT has the danger of marginalized those that lack the necessary skills. Developing countries have high levels of illiteracy, in which women and girls predominate, and combined with possible fear of new technology may leave some disadvantaged. Without the fundamentals of literacy education, ICT cannot provide empowerment, and therefore improved literacy for rural women with increased relevant content must form an integral part of development for ICT to become as asset in rural women's lives (ITU, 2011).

The decision to use voice or text based services could include or exclude certain members of the population. If voice based, then the spoken language to use could be problematic developing countries often have a high diversity of ethnic groups and local languages (Bhavnani *et al.*, 2008).

Literacy not only excludes people from taking full advantage of text based services, but will generally affect business skills also. Any program to develop ICT for SMEs must ensure that literacy and education are not neglected (Duncombe, 2007).

Therefore, in Somali region various literatures have indicated that educational status is one of the potential explanatory variables that influence ICT utilization by improving information processing capability of household and community as a large. Thus, Qur'anic schools and formal education were hypothesized to influence the ICT utilization status for poverty reduction. According to the survey conducted by DPPB (2016), 98% of the pastoralist don't read and write in English while 67% of adult pastoralist read and write Somali language, as the main language of websites and mobiles is entirely in English. It imposed additional barriers to illiterate section. With regard to ICT for using poverty reduction to timely purchase and delivery in the market. (DPPB, 2016).

4.3.3 Effective Communication Policy in Modern Information Age

ICT policy is believed to be one of the main factors that determine the extent of communication infrastructure in a given country (Kaoru *et. al*, 2011). Particularly, in the era where innovation and technological advancement on communication technologies grows at a higher rate, effective ICT policy found to be crucial for corresponding socio economic development (Kramer *et. al*,

2007). Mainly, effort to make those marginalized poor as one of the beneficiaries is important task needing the involvement of different agents including households, institutions, governmental and non-governmental organizations.

Basically, technological diffusion and adoption in many developing countries is negatively influenced by lack of effective communication policy. The paper presented by Heeks, et al (2010) revealed that lack of coherent ICT policy is counted as the main challenge of these countries in optimizing benefit from the application of ICTs. Their paper revealed that, coherent ICT policy involves both horizontal and vertical perspectives by which the former requires ICT policy not only seeks to put infrastructure available, but also ensures there are policies that support the utilization in appropriate way. Similarly, vertical coherence indicates the prevalence of policy integration among those involved in policy implementation (Helen, 2010).

Therefore, ICT policy that promotes the involvement of both public and private sector in provisioning of communication goods and services is expected to raise the benefits accruing from the application of ICT. Another policy area is concerned on privatizing telecommunication sector which is possibly opens competitions in the sector so as to improve the accessibility and quality of the service (Lalem, 2002). Tracing on microeconomic theory of household consumption behaviour, cutting tax on ICT goods and services possibly increases the application of these technologies through the countered increase in purchasing power of the households (Victoria, 2002).

Overall in Somali region there is no policy adopted to develop ICT and use of serving the society in different perspective. It is believed that institution have the possibility of optimizing ICT devices to maintain effective communication with public or private stakeholders but application of these devices as a tool of exchanging information with the local community is not observed and less attention was given in the region(DPPB, 2010). According to FWESNET report in (2011).Lack of ICTpolicy in the region have caused many cost transactions and less information follow to prevent hazards in the region and development effective response plan to promote livelihoods and build resilience of the communities. This indicates, efficient use of ICTs can be used as a bridge for exchange of information among internal or/and external customers as the key beneficiaries would be included farmers, students, patients and women(FEWSNET, 2011).

4.3.4 Affordability

For ICTs to become relevant for poverty reduction they have to be affordable. Needed financial resources include those necessary for the supply of a technical infrastructure and those necessary to create demand for user technologies, information and communication services. Over the long term, ICTs are expected to become cheaper, as developments in the field of software, likewise, may contribute to overcoming some of the problems that poorer countries face in terms of infrastructure. In the short run, however, the inability of the poor to raise their standard of living and afford to purchase either collectively or individually ICTs services is a major barrier. Their ability to access new user technologies will depend on the level of growth that can be sustained within individual economies to raise incomes among consumers and generate the necessary investment public and private in national networks (Khan, 2001).

In Somali Region, affordability is an issue in the rural areas the cost of fixed lines mobile phone credits and computers are much higher than those charged in urban areas, and within the poorest communities it tends to be the greatest because they need to pay for charging their mobiles and credit cards has higher 5% than the one sell in the town (OXFAM, 2016). Evidence suggest that in the region the proportion of income that the poor can afford to allocate to telecommunication services vary between 0.5% and 2% of their income, (SRI, 2011). In Rural poor households in Ethiopia will not have the capacity to fully pay for communication services for many years

5. CONCLUSIONS AND RECOMMENDATIONS

As defined ICT a diverse set of technological tools and resources used to communicate, disseminate, store, and manage information, it is a holistic that can be used socially, economically and politically to positively change the living conditions and alleviation of poverty. Poverty varies between socio-economic activities and it is a multidimensional concept, there are two types of poverty absolute poverty and relative poverty. However the absolute poverty is common in developing countries which include lack of basic necessities for survival.

There are direct relationship between ICTs and poverty alleviation at HHs level. Accessing ICT will improve the living standard and generally enhance the economic growth of the country, lack of accessible and affordable communication services are inhibiting the transmission of market information, preventing interaction between producers and hampers overall smoothness of services.

Several explanatory variables used in this study were found to be positively or negatively correlated with ICT in poverty reduction, based on the literature review, results and discussion the following are the challenges of ICT for poverty reduction literacy, lack of electricity, affordability lack of ICT policy adoption while Opportunities drawn in the discussion are disaster relief, livestock marketing, application of ICT in the institutions and lastly giving voice to the poor, developing countries is negatively influenced by lack of effective communication policy but application of these policy is not observed and less attention was given in Somali region the region.

According to the study conducted in Godworedas concluded that the radio has changed the lives of poor and in general the riverine areas for communicating and disseminating information in relation with their product. While also revealed that the poorest communities it tends to be the greatest because they need to pay for charging their mobiles and credit cards has higher 5% than the one sell in the town

Therefore, the study found that five out eleven zones have 24/7 electric power which inhabited many institutions and investment to be less attractive to the investors, in this case shortage or lack of access to electricity is not only deprives people of such basic necessities as lighting and communication and constrains their access to social services but also hampers productivity and

economic development. Therefore, the direct impacts of ICT on poverty reduction take several routes. First, there is the educational aspect.

Information and knowledge enable the poor to understand their own circumstances and to voice their own opinions and needs. 98% of the pastoralist don't read and write in English while 67% of adult pastoralist read and write Somali language, this imposes additional barrier to utilize ICT for their daily activities. So introduction of Somali software will help them to achieve incredible poverty reduction in the region

5.2 RECOMMENDATIONS

Based on the findings of the study and conclusions drawn, the study recommends that the Region should focus strengthening ICT use in many aspects of reducing poverty in rural and urban areas to develop by constructing more interlinking sectors electrification, telecommunication and Equally, it is also recommended that national ICT policy should be adopted to the woredas as well as in the region, this will promote the opportunity of using ICTs for poverty reduction in order to enhance information market price in agricultural sector and pastoralistif improvements could be made to communication infrastructure would allow pastoralist to more effectively participate in markets. Thus, the following recommendations could help to ensure poverty reduction in relation with ICT

- It also recommended to introduce to the Mobile phones and computers in Somali language software that enable them for reading and writing
- Expansion of hydroelectric power is significant as a key for the development of businesses in the region and country at a large that can be sustained within individual economies to raise incomes among consumers and generate the necessary investment public and private in national networks which will lead poverty reduction at households level
- As the main challenges of using ICT is literacy adult education and alternative basic educations in the region should be strengthened in order to lift out from poverty and allow them to use ICT for their daily activities such as marketing and information sharing

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