The Role of ICT in Economic Growth and Poverty Reduction

Okello G[1], Adhiambo M [2], and Maritim K.[1] Ouma E[3]

[1]Department of Agricultural Extension and Rural Development, University of Eldoret, P.O.Box 1125-30100, Eldoret,

[2]Department of Education, Jaramogi Oginga Odinga University of Science and Technology, P. O. Box 210-40601, Bondo, Kenya.

[3]University of Eldoret, Department of by Agriculture and Biotechnology, box 1125-30100

Corresponding Author: *godi.okello08@gmail.com/+254722421111.*

ABSTRACT

Information technology has a great impact in all aspects of life and the global economy is currently undergoing fundamental transformation. Information technology has very real impact in most of Industries and in all aspects of economy, while businesses and enterprises continue to undergo considerable changes. Usage of these technologies is revolutionizing the rules of business, resulting in structural transformation of enterprises. Modern businesses are not possible without the help of information technology, which is having a significant impact on the operations of Small and Medium Sized Enterprises (SME) and it is claimed to be essential for the survival and growth of economies in general. This paper aims at giving an overview of what is currently know about the applications of Information and Communication Technology (ICT) in developing economies and in stimulating economic growth and poverty reduction. It draws attention to the cross-cutting applications of ICT, to its role as a tool, not a goal, and links its use to development co-operation. The paper presents two key objectives. The first Objective is to study the application of ICT in economic growth. The second objective is to study the role of ICT as a poverty reduction strategy. The paper will clarify the debate on the role of ICT, and give a framework for extending the discussion so that ICT may find its rightful place in development co-operation.

Key words: *ICTs, Economic Growth, Poverty Reduction Strategy*

1.0 Introduction:

1.1 For more than a decade, information and communication technologies (ICTs) have plaid a key role in both economic growth and poverty reduction. They increase efficiency, provide access to new markets or services, create new opportunities for income generation and give poor people a voice. And while considerable improvements have been achieved in Africa with respect to certain aspects of ICT including the spread of mobile telephony and an increasing number of national ICT strategies as well as regional initiatives, there are still areas where improvement is needed in order for Africa as a whole to be able to take advantage of the benefits of ICT.

The African situation is characterised by complexity and diversity. This stems from the fast developments and transformations in the dynamic field of ICT, the numerous initiatives; and the diversity of stakeholders, including the G8; the New Partnership for Africa's Development (NEPAD); the UN Economic Commission for Africa (UN-ECA); the International Telecommunication Union (ITU); other UN organisations; international net-works such as the Global Knowledge Partnership; various non-governmental organisations (NGOs); research centres; bilateral donor agencies; development banks and many private sector actors. Furthermore, the situation in Africa varies significantly between the North and South as well as within countries and regions, which demands specific interventions rather than "one-size-fits-all" approaches.

Development agendas have not fully exploited the role that ICTs can play in poverty alleviation among the urban poor. Conventional approaches to alleviate poverty have been in the form of aid and handouts; these have long lived their usefulness given the rate of ICT's diffusion worldwide. ICTs have fostered in some ways social exclusion for communication systems, which has led to the weak or fragile capital base resulting from the seclusion from business opportunities and worsen their plight (Kabeer, 2003). Continued exclusion of the urban poor continues to hamper the means and ends of poverty reduction programmes.

The role of ICT is catalytic in the complex task of poverty reduction by leveraging the effects on earning opportunities, on educational and health services, on good governance and on promoting democracy. Since information exchange is part of nearly every element of the economy, the impact of improvements in the capacity

In information exchange will depend critically on how the rest of the economy

functions. This suggests the centrality of a holistic approach in evaluating the impact of ICT. For example, the impact of improved ICT access on farm earnings through increased knowledge of market prices will be muted if the markets are not accessible due to poor roads, or there are no markets because of an unreformed agricultural sector (World Bank 2001).

Any approach in using ICT in the interest of poverty reduction has to be broad-based and tailored to various sectors and build inter-linkages (Ibid). According to a study carried out in India, Jamaica and South Africa, the effectiveness of ICT in combating poverty depends on i) complementarities with other local level poverty reduction and development initiatives, ii) responding to the local community needs, and iii) involving stakeholders in applications development (Millar and Mansell, 1999).

The UN ECOSOC Ministerial Declaration (2000) provided special attention to the application of ICT for development, for which urgent and concerted actions at the national, regional and international levels have been suggested. A Microsoft Corporation (2007) report on its ICT initiatives in Africa acknowledged that technology alone does not drive development but enables it. In the report, while noting that 300 million Africans live on less than $1 per day, it is asserted that: *ICTs offer special opportunities to stimulate growth and increase innovation in every local setting, thereby enabling individuals and institutions to interact more productively with the global economy and the wider world. But to realize their potential, technologies must be part of a mix of productive changes and supporting capabilities. Resources must be matched by resourcefulness – combined with other initiatives by local leaders, educators and entrepreneurs to achieve*

individual and institutional objectives. "ICT for Development" is therefore an effort to distinguish the most constructive opportunities to apply technologies for growth and poverty reduction. (p. 4)
Definition:

ICTs

Information and Communication Technologies have been defined in various ways. Unwin (2009) views ICT as an umbrella term which covers any communication device or application encompassing: radio, television, cellular phones, computer and network hardware and software, satellite systems and so on as well as the various services and applications associated with them such as videoconferencing and distance learning (p. 77).

Torero and Braun (2006) offer a much broader definition of ICT which encompasses equipment and services. For them, ICT "includes the computing industry (hardware, software, networks, the Internet, and related services); electronic data processing and display (such as photocopiers, cash registers, calculators, and scanners, as well as a myriad of less well-known machines specifically tailored to production and manufacturing); telecommunications and related services (such as fixed and cellular telephones, facsimile machines, instant messaging, teleconferencing, and so on.); and audiovisual equipment and services (including television, radio, video, DVDs, digital cameras, compact discs, MP3 players, and so on" (p. 3).

ICTs stand for information and communication technologies and are defined, for the purposes of this primer, as a "diverse set of technological tools and resources used to communicate, and to create, disseminate, store, and manage information." These technologies include computers, the Internet, broadcasting technologies (radio and television), and telephony.

In recent years there has been a groundswell of interest in how computers and the Internet can best be harnessed to improve the efficiency and effectiveness of education at all levels and in both formal and non-formal settings. But ICTs are more than just these technologies; older technologies such as the telephone, radio and television, although now given less attention, have a longer and richer history as instructional tools. For instance, radio and television have for over forty years been used for open and distance learning, although print remains the cheapest, most accessible and therefore most dominant delivery mechanism in both developed and developing countries. The use of computers and the Internet is still in its infancy in developing countries, due to limited infrastructure and the attendant high costs of access.

Moreover, different technologies are typically used in combination rather than as the sole delivery mechanism.

ICT (information and communications technology - or technologies) is an umbrella term that includes any communication device or application, encompassing: radio, television, cellular phones, computer and network hardware and software, satellite systems and so on, as well as the various services and applications associated with them, such as videoconferencing and distance learning. ICTs are often spoken of in a particular context, such as ICTs in education, health care, or libraries.

It has been argued that ICT is a principal driver of economic development and social change worldwide (Kozma, 2005; Leech, 2008). In many countries, the need for economic and social development is used to justify investments in educational reform and in educational ICT. Another notable argument to this effect is by Kelles-Viitanen (2003) who refers to developing countries in general, commented that ICT plays a major role in all aspects of national life: in politics, in economic life, as well as in social and cultural development. She further argued that ICT is rapidly transforming the way people do business, access information and services communicate with each other and even entertain themselves.

Economic Growth.

Definition of Economic

A social science that studies how individuals, governments, firms and nations make choices on allocating scarce resources to satisfy their unlimited wants. Economics can generally be broken down into: macroeconomics, which concentrates on the behaviour of the aggregate economy; and microeconomics, which focuses on individual consumers. Or

Economics is a study of man in the ordinary business of life. It enquires how he gets his income and how he uses it. Thus, it is on the one side, the study of wealth and on the other and more important side, a part of the study of man.

It may also be defined as, 'Economics is a science which studies human behaviour as a relationship between ends and scarce means which have alternative uses'.

Economic growth:

Definition

Economic growth: is the Increase in total value of goods and services produced. (Measured by GDP) Development – Improvement in human welfare, quality of life, social well being. Satisfying the population's needs and wants. (Measured using a range of socio-economic indicators) Sustainable development – "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

It may also be defined as the increase in the market value of the goods and services produced by an economy over time. It is conventionally measured as the percent rate of increase in real gross domestic product, or real GDP. Of more importance is the growth of the ratio of GDP to population (GDP per capita), which is also called per capita income. Or

Increase in a country's productive capacity, as measured by comparing gross national product (GNP) in a year with the GNP in the previous year. Or

Increase in the capital stock, advances in technology, and improvement in the quality and level of literacy are considered to be the principal causes of economic growth. In recent years, the idea of sustainable development has brought in additional factors such as environmentally sound processes that must be taken into account in growing an economy.

Growth is usually calculated in real terms – i.e., inflation-adjusted terms – to eliminate the distorting effect of inflation on the price of goods produced. In economics, "economic growth" or "economic growth theory" typically refers to growth of potential output, i.e., production at "full employment".

As an area of study, economic growth is generally distinguished from development economics. The former is primarily the study of how countries can advance their economies. The latter is the study of the economic aspects of the development process in low-income countries.

Since economic growth is measured as the annual percent change of gross domestic product (GDP), it has all the advantages and drawbacks of that measure. For example, GDP only measures the market economy, which tends to overstate growth during the change over from a farming economy with household production. An adjustment was made for food grown and consumed on farms, but no correction was made for other household production. Also, there is no allowance in GDP calculations for depletion of natural resources.

Types:

Under this study we have,

- Intensive growth is an increase in per capita income of a country.
- Extensive growth is a GDP growth caused only by increases in population or territory.

Intensive growth is the aggregate increase in economic activities, growth generated by adding more labour and or capital by improving skills and technology. Growth is driven by enhanced productivity (high output per unit of input) rather than augmented factor supplies.

Extensive growth on the other hand is based on expansion of quantity of inputs in order to increase the quantity of outputs. Thus, growth is likely to be subject into diminishing returns. It's therefore, often viewed as having no effect on per capita income in the long run.

Reliance on the extensive growth can be undesirable in the long run because it exhausts the resources. To maintain economic growth in the long run, especially on per capita basis, it's good for an economy to grow intensive, by improvement in information technology or organization thereby increasing production possibilities of the economy.

Poverty Reduction Strategy

Poverty is scarcity or dearth, or the state of lacking a certain amount of materials possessions or money. Or it's a condition where people's basic needs for food, clothing and shelter are not being met. Poverty is generally of two types: (i) absolute poverty, (i) relative poverty.

Absolute or extreme Poverty is when people lack basic necessities for survival. People cannot obtain adequate resources for instance, lack of clean water, proper housing, sufficient clothing or medication and are struggling to stay alive. This is mostly common in developing countries and some part of Europe for homeless people.

Relative Poverty on the other hand, is when people's ways of life and income is so much worse than the general standard of living in the country or in the region in which they live and struggle to live a normal life and to participate in an ordinary economic, social and cultural activity. Or,

People are said to be living in poverty if their income and resources are so inadequate as to preclude them from having a standard of living considered acceptable in the society in which they live. People who are relatively poor will also be hard pressed to find the resources to enable them to make productive use of ICTs.

Poverty can affect individuals only or a society as a whole. Whole human societies become poor when the highly complex process of location, conversion, exchange, and distribution of resources are short-circuited or foiled on such a large scale that significant parts of the population are classified as poor. Individuals become, poor when they do not have, or cannot, find any rewarded role within resource dealing processes, or are excluded from them, for whatever reason. Their poverty is due to the fact they do not have roles or functions rewarded in their society's quest for the location, conversion, exchange, or distribution of resources, nor are they compensated for this lack.

In a nutshell, poverty is the result of any of thousands of possible kinds of failure or obstruction somewhere in the highly complex series of processes involved in the location, conversion, exchange, and distribution of resources. Lack of appropriate technology to realise fundamental human goals can be an important one amongst the many causes of poverty.

If the lack of appropriate technology is one of the important causes of poverty, what role can ICTs play in the eradication of poverty? This question must be answered in two parts. First, Individuals and society are deeply intertwined, in the sense that their fates are linked and have a reciprocal influence on one another. This means that individuals and society have a complex complementarities, i.e. strong individuals with properly focussed outputs can, though not necessarily will, benefit their society, and weak societies often, though not always, fail to equip their members for successful survival. If this truism is accepted, then interventions to eradicate poverty must never focus on either individuals or society alone.

This implies that any interventions to eradicate poverty must ensure a multitude factors which are in place in society that will enhance the ability of poor individuals to acquire capacities and learn responsibilities that will enable their escape from poverty. Social issues, such as governmental budget priorities, a state's macro-economic policies, and entrepreneur-encouraging practices that indicate the need to transform a society, require as much attention as individual requirements for education and training, or feeding and housing schemes.

The ideas about the societal infrastructure and policy framework needed for the empowerment of individuals and for the development capacities of individuals required to strengthen the intellectual skills and capacities available to society apply similarly to the challenges of providing a society with comprehensive ICT connectivity that reaches the majority of the population. National policies and subsidies to create enabling environments for investment in and deployment of ICTs must go hand in hand with individual training, capacity-building and empowerment to deliver the human labour power needed to optimally exploit the usefulness of ICTs.

The second part of the answer to the question about the role of ICTs in the eradication of poverty now comes into play if certain preconditions are met,

These preconditions are: (1) enough resources and infrastructure must be available to provide a constant flow of electricity and effectively functioning telecommunication connectivity, as well as resources to afford appropriate ICT equipment, software, and their maintenance; (2) sufficient numbers of people must have adequate literacy skills and appropriate training to master ICT programmes relevant to poor people's needs and to properly maintain ICT equipment; and (3) the challenges requiring detailed attention in order to enable the eradication of the poverty of specific persons must be amenable to the particular functions that ICTs can fulfil, i.e. advanced and improved administration, automation, calculation, information storage and retrieval, communication, and entertainment.

What are the possible links between Poverty and ICTs?

We want to examine the possible impact of ICTs in two cases:

Case I: ICTs, Individuals and poor Societies.

Imagine a very poor society where the vast majority citizens make livelihoods from agriculture. The citizens are illiterate and have barely enough means to buy seeds, agricultural tools, or fertilizer. ICTs for use by themselves make no sense, as they have more urgent priorities for simpler technologies to enable them secure the necessaries for survival. One can imagine that government or civil society relief organizations might use ICTs to improve the productivity and effectiveness of the services they provide to such rural poor people. One could also think that the children of the rural poor might be empowered by being taught basic uses of ICTs, provided ICT competent teachers, electricity, and telecommunication infrastructure are available.

Desperately poor people might have other needs for ICTs not related to the means they require directly for survival. For instance, they could want improved communication with their children, parents, and friends. They might benefit a lot from knowing in advance about inclement weather approaching, or from receiving accurate information about governmental services available to them. Poor people might want to become involved in protest action to strengthen their voice to express demands for better governmental services. Through the use of ICTs that empower their communication and improve their information they can participate more readily.

One should also not underestimate the value of the entertainment ICTs can provide poor people. Lack of suitable, affordable entertainment is a fairly common complaint by poor people.

Now let us imagine a slightly better off society with huge urban populations and semi-literate to literate citizens. Suppose such a society has an upwardly mobile economy where at least some opportunities become available for decently trained individuals by way of permanent employment in civil service departments or administrative, managerial, or specialist positions within smaller or larger companies. Skill and knowledge in ICTs might just provide the edge for many talented people to grasp the opportunities for employment to escape their poverty. Similarly, in such a society some kinds of entrepreneurs can set up small businesses that might easily outperform others through the advantages that good accounting software the calculative-financial functions such as M-pesa, M-banking, excellent information retrieval software the information function, or stock taking software the administrative function can provide.

Case II: ICTs, poor Individual in rich societies

Let us now imagine how the lack of ICTs in a person's employability profile can impoverish a person and impair that person's effective functioning in a rich, modernized society. In most well off, technologically advanced societies competencies in the efficient use of ICTs have almost become prerequisite for employment in a very large range of jobs. People who are ICT poor are almost disqualified from good employment. They are furthermore excluded from many opportunities to get the benefits offered by ICTs, like improved communication. Their interpersonal functioning is not as optimal as their society makes possible and their abilities allow. In a metaphoric sense their lives are thus also impoverished by their inability to utilise technological resources that can enhance the quality of their lives and help them accomplish some of their fundamental goals.

Understanding Poverty

In this study, understanding poverty has undergone significant changes. It is no longer viewed as being restricted to material deprivation, but encompasses intangible aspects, such as lack of access to schooling or health care, vulnerability towards external events or being excluded from decision making processes. This broad approach is also reflected in the previously discussed MDGs, which address this diversity of issues. In line with the World Bank Development Report 2000/2001 (World Bank), poverty will be looked at in terms of promoting opportunity, facilitating empowerment, and enhancing security.

Opportunity: Material opportunities are central to development. Many material opportunities (such as jobs, credit, roads, electricity, water, sanitation) are created by growth. However, the quality of growth is crucial. Mechanisms need to be in place to reflect local conditions and to compensate for potential losses during transitions. Or in the words of BDO: 'Expanding opportunity for poor people by stimulating economic growth, making markets work better for poor people, and working for their inclusion, particularly by building up their assets, such as land and education.'

Empowerment: Public actions are determined by the interaction of political, social and other institutional processes. Achieving access to and accountability for public actions requires the collaboration of all groups of society. ICT strengthens the ability of poor people to shape decisions that affect their lives and removing discrimination based on gender, race, ethnicity, and social status as central elements of facilitating empowerment.

Security: Increased security means 'Reducing poor people's vulnerability to sickness, economic shocks, crop failure, unemployment, natural disasters, and violence, and helping them cope when such misfortunes

occur.' This requires effective national action to reduce the risks, as well as building assets of poor people (diversifying household activities, providing insurance mechanisms etc.).

Poverty Reduction Strategy

These are documents required by the International Monetary Fund and the World Bank before a country is considered for debt relief within the heavily indebted poor countries initiatives. Or,

Poverty reduction strategy paper (PRSP) are prepared by member countries through participatory process involving domestic stakeholders as well as engaging development partners , including the World bank and the international Monetary Fund (IMF). Updated in every three to five years within annual progress report. PRSP describes a country s economic, structural and social policies and programs over three years or longer horizon to promote broad based growth and reduce poverty as well as associating engaged financing and major sources of financing. Interim PRSP (I-PRSP) summarise the current knowledge and analysis of a country's poverty situation, describe the existing poverty reduction strategy, and lay out the process of doing a fully PRSP in a participatory fashion. For instance the Kenya Vision 2030 which was prepared by the ministry of state for planning and national development and office of deputy prime-minister and ministry of finance in November 2011.

As illustrated above, the concept of poverty is a multifaceted one. Consequently poverty reduction strategies reflect this complexity and approach the phenomenon from different angles. All of them represent underpinning visions of the economy and society and the differences among them indicate their respective points of view.

Some of the different strategies are: pro-poor growth strategy; sustainable livelihoods strategy; rights and empowerment strategy and resources and redistribution strategy. For the purpose of this Study, the focus on poverty reduction strategies will be one of the key issues of which are health, Livelihoods, and governance, with capacity development as a cross-cutting issue. All of these are relevant on a national, regional and global level.

Health: Health is an issue that cuts across all poverty reduction strategies. First of all; good health is an asset, which cannot be taken for granted, especially not by poor people. It is a precondition for any sustainable livelihoods strategy. Equal access to medical services is a key issue that is in the rights and empowerment strategy and indicates the overlapping of this area with the issue of governance. In this field, interesting experiences have been had by BDO partners in Uganda and Zambia with youth as target. The discussions around HIV/AIDS drugs are an illustration of a current topic that also touches the resources and redistribution strategy.

Livelihoods: 'Livelihood systems comprise a complex and diverse set of economic, social and physical strategies. These strategies are realised through the activities, assets and entitlements by which individuals make a living.' They can, therefore, only be understood and addressed in an integrated manner. Since the majority of poor people live in rural areas (though an increasing population of poor people in urban areas has been reported) livelihood strategies in this paper will focus on farming and agricultural issues. There are interesting experiences related to the broadcasting of information on farming methods especially by community/local radio.

Governance: 'Governance focuses on the interaction between the state, the private sector and the civil society and should enable a participatory, equitable and gender balanced, transparent, efficient and accountable management of public affairs.' In relation to ICTs, a key concern in governance is policy and

regulation. Issues such as rural access, interconnectivity, and monopolies for service providers are all key to the potential benefit that poor people get from ICTs directly in terms of increased access and better quality service and, indirectly, through their role in overall development.

Capacity development: The definition of this term includes two approaches: it has to define what is developed and how it is developed. Therefore, definitions are often split in statements about capacity and about development: Capacity refers to 'abilities, skills, understandings, attitudes, values, relationships, behaviours, motivations, resources and conditions that enable individuals, organisations, networks/sectors and broader social systems to carry out functions and achieve their development objective over time. Capacity development refers to the approaches, strategies and methodologies used by developing countries, and/or external stakeholders to improve performance [at different levels]." The key concept is change. Capacity development is fundamentally about transformation and is therefore most likely not linear (though oriented towards a goal!). This implies that it goes beyond the conventional perception of training. Other relevant points that derive from this definition and are important to bear in mind are (a) the differentiation between indigenous processes and donor-supported/-initiated processes, as well as the interrelationships between these two; and (b) the levels/contexts in which it occurs and again the relationship between them. For this study, the following levels will be considered: individual, organisational, sector/network and enabling environment efforts. These are part of an overall enabling environment, in which the rights and empowerment approach to poverty reduction can be placed. Fundamental issues, such as freedom of expression, participation, ownership and accountability, are a prerequisite for sustainable poverty reduction.

Objectives of the study:

1.To study the application of ICTs in economic growth,
2. To study the use of ICT as poverty reduction strategy.

2.0 Literature Review:

This review synthesises the literature on uses of information and communications technology (ICT) in primary and secondary schools in Sub-Saharan Africa (SSA), with a particular focus on Commonwealth countries and on East Africa. It focuses on the role of ICT in improving the quality of learning and teaching in schools in Kenya, Tanzania, Uganda, Rwanda and Burundi with reference to technologies appropriate for this context.

In so doing, the review casts new light on the supporting and constraining factors that influence ICT integration in education in the region. It begins by presenting a historical perspective of the ICT policies in education and the rationale for the formation of these ICT policies. It then discusses the policy framework for each country, specific reasons for policy formation, policy objectives and strategies. The review pays close attention to the stakeholders while providing details on what steps individual countries have taken in the formulation of the ICT curriculum as stated in the various policies. It also looks at how the various policies address continuing professional development (CPD) for teachers and how these have been implemented in the various countries. It is noted that although the East African countries have historical backgrounds that are almost similar, they all are at different levels of development. This could be attributed to how the individual countries have adopted the use of ICT, which has become associated with current and future educational, social and organisational development as noted by Minishi-Majanja (2007).

Although several countries make up this region, East Africa as it is known today comprises Kenya, Tanzania, and Uganda and in a wider sense Burundi and Rwanda as these five countries constitutes the East African Community (EAC). Between the nineteenth and twentieth century, East Africa was torn apart by the

competition between colonial nations of the time and to a certain degree became part of the European colonial empire. However, after the colonial rulers gave power back to the locals, the subsequent independent states became illiberal and corrupt and experienced political coups, civil strife, ethnic violence, oppressive dictators and bad administration - factors that have stagnated the national and regional development of the East African countries.

Education is one such sector which has been affected by dwindling economies and subsequent poverty. Faced with these and many other challenges, the East African countries were keen to embrace technology which can potentially be an important agent of development. This is because the positive effects of ICT use in the developed countries had continually been noted, and it became critically important for developing countries of Africa to embrace technology. The role of technology in national development was undeniably significant as Minishi-Majanja (2007) rightly puts it. What followed then was a proliferation of ICT use which Ochuodho and Matunga (2004) refer to as "electronics burst". However, this emergence and use of ICTs were rather hasty and haphazard as noted by Waema (2005), and thus necessitated streamlining. At the turn of the millennium, most of the East African countries, with the aid of donor agencies, formulated ICT policies to curb the anomalies. The earliest of these reforms was referred to as the "Draft National Informatics Policy" in Kenya (Ochuodho and Matuga, 2004).

We now briefly discuss the policy formulation process and the key aspects of ICT in education policies for each of the EAC countries.

Kenya

The earliest attempt at ICT policy formulation in Kenya dates back to the 1980s, but the process remained incomplete by 2000 (Nduati & Bowman, 2005). The formation of ICT policy in Kenyan education has its roots in the Ministry of Research of the time. The motivation was to develop national policy guidelines for the development of ICTs in the country in order to address the then prevailing haphazard growth of the sector. This was complemented by the readiness of donor agencies including UNESCO, in funding the current policy-making process. Reports by both Waema (2005) and Farrell (2007) seem to agree with the idea that fast and haphazard growth of information technology lacking direction and regulation provided an impetus for ICT policies as mentioned earlier. The second reason reported was a desire by the then Permanent Secretary (PS) in the then Ministry of Research, Technical Training and Technology (MRTTT) to develop national policy guidelines. This, as the Ministry expected, would steer the development of ICTs in the country in order to address the haphazard growth that was taking shape. The third factor was the readiness by the donor agency and in this case UNESCO to fund the policy making process.

Tanzania

This final reason for policy formation in Kenya could be equated to Tanzania's where the need to develop an ICT policy led to the formation of a grouping called the e-Think Tank, a forum supported by the United Nations Development Program (UNDP). As reported in the ICT survey report by Twaakyondo et al. (2002, p. 5), the e-Think Tank's stated objective was to "present the public and Government with ideas and suggestions to help the transition of the country into the information age". According to the report, one important objective of the e-Think Tank was to help harmonise the current ICT Policy and regulatory environment with that of neighbouring states and partner countries. The consultative process culminated in the formulation of the national ICT policy in 2003. The policy aims at expanding and developing the teaching of ICT at all formal and informal levels of the national education system and using ICT to improve the quality of education and training in all areas including distance learning. The policy proposes to develop and deploy a nationwide e-education system that interconnects schools and higher education/training

facilities across the country with each other. (Tanzania Ministry of Communications and Transport, 2003, pp.13-14)

Uganda

In Uganda, the national ICT policy development process was initiated in 1998 by the Uganda National Council of Science and Technology (UNCST) (Torach, Okello and Amuriach, 2006). Five years later in 2002 the UNCST submitted a draft national ICT policy framework to the cabinet which was approved the following year. The policy framework document recognised that Uganda would need to embrace the goal of lifelong education for all (Farrell, 2007).

Rwanda

The country accepted ICT as central to its Vision 2020 (Farrell, 2007) and is one of the core pillars of the country's National Information and Communications Infrastructure Policy and Plan, adopted in 2000. It is expected that the country will achieve middle-income status by 2020 based on an information-rich, knowledge-based society and economy, achieved by modernising its key sectors using ICT. This vision, developed through a national consultative process begun in 1998, was the reason for Rwanda's formulation of the ICT policy (Were, Rubagiza, Denley and Sutherland, 2007).

The policy is being implemented in 5-year planned phases referred to as the National Information and Communications Infrastructure (NICI) plans. Phase 1 began in 2001 and concluded in 2005, while Phase 2 covers the period from 2006-2010 (Rwanda, UNECA, 2006). These plans are based on the relevant vision for Rwanda (VfR) mission strategies which in the case of ICT are to:

- Transform Rwanda into an ICT-literate nation;
- Transform the educational system using ICT with the aim of improving accessibility, quality and relevance to the development needs of Rwanda;
- Improve the human resource development capacity of Rwanda to meet the changing demands of the economy.

The NICI plan has clearly elaborated activity plans relating to the integration of ICT in education. In the NICI-2010 plan, seven policy action items relating to ICT in education are elaborated. Three of these have direct bearing on primary and secondary education: (1) use of ICTs for formal education, (2) improvement of formal education in ICT, and (3) helping educational institutions improve their business processes. All the planned actions to achieve these goals are clearly laid out with specific timelines. It is not surprising therefore that Rwanda has recorded a dramatic rise in ICT usage in schools. Farrell (2007) reported a growth rate from only one school with a computer in the whole country in the year 2000 to more than half of the primary and secondary schools being equipped with ICT hardware 6 years later; and the rollout still continuing.

Burundi

While Burundi's 1993 crisis had a devastating effect on education and greatly exacerbated the underlying problems that existed before, an update of the 2004 ICT policy was adopted in 2007 by the Burundi government (Hare, 2007) specifically to promote the connection of ICT in the rural areas of the country (Novatech, Burundi Country Profile 2008). The national ICT for development policy was expected to focus on the adoption and use of ICT by the country to achieve its six strategic objectives (Hare, 2007), namely (1) capacity building; (2) enhancement of a legal and regulatory environment; (3) promotion of a base infrastructure; (4) promotion of good governance; (5) promotion and encouragement of private investment,

and (6) promotion of the development of content and applications. However, the country has no specific policy for ICT use within the education sector, despite recognising it as an enabler of education. This means that ICT initiatives are not a core part of the government development plans, and therefore lack focus, resources and a nationalistic outlook (Hare, 2007b; Novatech, 2008).

All of the five countries have developed a national ICT strategy at different times, ranging from the year 2000 (Rwanda) to 2007 (Burundi). With the exception of Burundi, the countries have developed an educational ICT policy which is guiding the investments in ICT in education. It is evident that levels of government investment have increased after the adoption of the specific ICT in education policies.

In the three countries forming the initial East African Community (EAC), the role of government is mainly a coordinating one – bringing together different donors under consortia directed by the government. Rwanda, which joined the EAC later, has seen much more direct government investment in ICT in education from the national budget. Burundi, also a later member of EAC, did not have evidence of direct government investment. The other four countries all have operational education management information systems (EMIS), from which basic biographical school data (at least) can be obtained.

3.0 Research Methodology:

3.1 For the purpose of this study, secondary data was obtained from:

- Review articles and Critical analysis essays,
- Bibliography,
- Original research findings never before shared,
- Government documents and public records,
- Textbooks
- Journals, etc.

4.0 Findings:

The promise of ICT to contribute to poverty reduction lies in its power to give poor women and men access to improved information and communication technology. ICTs broadly allows for a reduction in a transaction costs improves communications with markets and within the supply chain, and improved information about new opportunities. ICTs can also improve the information system of enterprises. More specifically, ICTs can:

- Provide reliable access to market (local, national and international) through increased use of affordable communications (phone, radio, fax, email etc)
- Improved contact with suppliers and transport links to and from the market (e.g. through databases of enterprises, products and suppliers)
- Inform choices particularly regarding the prices of raw materials and finished goods enabling better prices for enterprises when dealing with traders.
- Provide information about locally and internationally available development, business skills and marketing, education, training, schemes.
- Provide direct or intermediate access to (training packages , better advice , and better practice)

.Provide access to legal information including information on contracts law, tax law, registration and regulations.

- Provide improved access to information about financial services (e.g. micro finance, I.M.F, etc), access to education services, weather pattern, create awareness to rural folks, etc.

5.0 Conclusion and recommendation:

While positive results have been achieved with ICTs in Kenya, as in several other Sub- Saharan African countries, considerably more needs to be done to address the challenges and weaknesses in policy design and implementation.

The current ICT market in Kenya is concentrated in urban and industrialised areas, leaving many areas and poorer social groups with limited ICT access. The Government has a responsibility to provide services to the people as a whole, and should work alongside the private sector to do this.

In particular, the government and private sector should provide better access in rural areas, and the private sector should address the needs of small and medium-sized businesses, particularly female market traders and small-scale farmers. More attention should be paid to developing hardware and software that are affordable and relevant to the needs of poor communities.

ICTs have considerable potential in eastern Africa, particularly in Kenya, but only if the necessary infrastructure and an enabling policy environment are put in place, drawing together government, business and other stakeholders to pursue a shared strategic model. The government, in particular, needs to address issues of connectivity, ICT governance, privacy, security, intellectual property and resource mobilisation.

At the same time, care should be taken to ensure that ICT programmes in Kenya are not just technology-driven. Instead, they should respond to the needs of the poor, in terms of content, language, skills required, design and price. It is important to address sectors that are directly relevant to poverty reduction and where the use of ICTs can make a difference. Local communities should be involved in the design of universal access programmes through consultation, surveys and demand studies.

Increasing access to Equipment and software:

Currently high taxes should be reduced on imported ICT equipment and software, and tax breaks should be used where appropriate to accelerate ICT adoption.

The government should encourage local software developers to develop small-scale packages that are suitable for local market conditions.

The policy on Environment:

The needs of communities should be assessed and incorporated into ICT policy and roll-out plans for underserved rural areas. This will require coordinated effort in government, to ensure that ICTs are incorporated by appropriate ministries into policies on healthcare, food and nutrition, clean water, and civil rights among others.

All stakeholders should be consulted and allowed to contribute to policy design and implementation.

Building ICTs infrastructure:

Public–private partnerships should play a leading role in the development of a national fibre optic network. This will require coordination between operators of fixed networks to ensure that installations are not duplicated while other areas remain unserved.

The government and private sector should also collaborate to provide tele-centres in rural areas, offering ICT access and training. The government of Kenya should learn from the success in tele-centre deployment elsewhere in Africa particularly in Rwanda with their vision 2020.

Capacity Building:

The government should undertake an ICT awareness campaign in collaboration with civil society organisations, using established media and delivered in local languages.

Rural populations in particular should be persuaded of the economic benefits of using ICTs. This will require substantial ICT literacy training, but will be important in reducing the economic and knowledge gap between urban and rural communities.

The ministry of education should include ICT teaching in schools and address the shortage of ICT skills among teachers first before embarking on one laptop per Child Policy 'OLPC'.

REFERENCES

Gerster Consulting under a mandate from the Africa Partnership Forum Support Unit.
the 10th Meeting of the Africa Partnership Forum in Tokyo on 7-8 April 2008,APF/TOKYO-2008/07, ' The ITC in Africa ,Boosting Economic Growth and Poverty reduction'

Bowora J. & Chazovachiib, B. (1976). *'the Role of Information and Communication Technologies in Poverty Reduction in Zimbabwe: An Analysis of the Urban Poor in Harare', International Journal of Politics and Good Governance, Volume 1 No. 1.3 Quarter III ISSN No. 0976-1195.*

Aniket Kelles-Viitanen (2003). *The Role of ICT in Governing Rural Development, a paper at the IFAD workshop on what are the innovation challenges for Rural Development, Rome 15-17,2003 11-14.*

Hennie Lotte, H.P.P(2007). *'Are ICTs prerequisites for Eradicating poverty', international Review of information Ethics, Vol.7(09/2007).*

Hennessy, S. & Onguko B.(2010). *Centre for Commonwealth Education and Aga Kha University Institute for Education Development-East Africa. 'Developing the use of ICT to enhaunce teaching and learning in Eastern African Schools'may 2010.*

Duncombe R. & Heeks,R.(2005). *Institute of Development and policy and management (IDPM),school of environment and development, Manchester, 'Information and communication technologies(ICTs),poverty reduction and Micro, small and medium scale Enterprises (MSMEs)' Nov,2005.*

Munsaka, J. S. & Tina James (2008). ICTs development in Zambia challenges and opportunities', www.ngopulse.org/files/Zambia_Research_Reoprt pdf.

Gerster, R. and Zemmamann, S.(2003). 'Information and Communication Technologies (ICTS) and Poverty Reduction in Sub-Saharan Africa' Oct,2003.