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Contents

Information and Communication Technology as the Indisputable Link in Poverty Reduction

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Abstract

There is a debate as to whether information and communication technologies (ICTs)[1] have a role to play in poverty reduction. Many argue that people need food not technology, a luxury they see as the domain of the rich. However ICTs now play a major role in all aspects of life and has revolutionised the way we live, work and interact. This is because information (the blood that runs through ICTs) leads to resources and opportunities that generate resources. It then goes without say that in an information society, the 'information poor' have also become the 'resource poor'. ICTs for development therefore have an increasingly vital role to play in the management of policies aimed at achieving the Millennium Development Goals, in data collection, creating networks, in informing greater numbers of people, ensuring greater accountability and in governance issues. ICTs can contribute to poverty reduction if specifically tailored to the needs of the poor. In a nutshell, the paper explores the relationship between ICTs and poverty, by looking at the ways in which ICTs can be used to help build local organising capacity, and to help the poor and marginalised people become visible, have a voice and gain access to information and knowledge that can improve their lives and livelihoods. It also outlines various factors that hinder the full utilisation of ICTs and provides recommendations as to how these constraints would be addressed.

Key terms: Development, Information, Information Communication Technologies (ICTs), Poverty reduction.

Introduction

Serwanga (2006) has defined poverty as: hunger, lack of shelter, being sick or not able to see a doctor, not having access to school and knowing how to read, losing a child to illness brought about by unclean water, powerlessness, and lack of representation and freedom. Broadly therefore, poverty extends beyond income and consumption to include inequality, health and education vulnerability. These dimensions of poverty impact the elements of well-being: security, empowerment and opportunity. Serwanga (2006) also identifies two types of poverty namely: absolute poverty and relative poverty. Absolute poverty refers to a situation where an individual or household is incapable of accessing the basic needs of life. It is characterised by malnutrition, illiteracy and disease. On the other hand, relative poverty is a situation under which one is poor relative to others. Reduction of poverty and hunger is a major macro-economic problem and that is why it is Millennium Development Goal (MDG) number one.

Over time, a number of approaches have been used to measure poverty. These include: per capita income, household and per capita consumption, food ratio and calorific intake among others. The

causes of poverty are also many, and have been understood differently by different people over time. For example, people argue that poverty is God given, in other words, it is part of the natural process. And yet God himself told mankind to tilt the land and eat from it, and that blessed are the hands that work. Others say that it is an individualistic problem caused by laziness, lack of initiatives and illiteracy.

Another dimension of poverty is lack of information. People are poor because they lack relevant information to apply in their day to day lives. Poor people can be found in both rural and urban areas. The majority though live in the rural areas and that is why this paper will focus on the rural poor. If this large populace in the rural areas can be equipped with the right information, that is relevant and appropriate, they will be able to identify opportunities that generate resources thus reducing poverty. This information will also allow the people to make choices to improve their current situations and have access to means of production (Mukoma and Bosire-Ogechi 2006). For instance, availability and access to relevant information on agriculture for instance will increase the ability of the poor to raise their incomes and hence increase quality of life.

Today's climate of political and socio-economic change is characterised by the concepts of globalization and information economy. Information and Communication Technology (ICTs) are seen as harbingers of prosperity as they can guarantee access to global markets, enable direct foreign investment and e-commerce. They have created a new world order of digital 'haves' and 'have nots' separated by what is called the 'digital divide'. Much effort is being geared towards reducing this divide, improving and spreading digital dividends to the information, knowledge and by extension, material to the poor of the world.

ICT as a term is collectively given to information technology spawned by the merger of computers and telecommunication. ICTs may be web enabled, networked, or stand alone; they may generate information or knowledge product or service. One feature of ICT is the convergence of media (print, audio and video – hence multimedia) made possible by a common digital platform. The 2000 Okinawa Summit of G7/G8 nations described ICTs as one of the most potent forces in shaping the 21st Century...fast becoming a vital engine of growth for the world economy (Flor 2001).

Many people feel that the African continent is not ready to invest in ICTs, when other more deserving and accurately pressing and perhaps life threatening areas of action such as health, education and agriculture are still in dire need. This feeling exists even among the educated, well placed and arguably well informed Africans.

To eradicate poverty therefore, nations should empower individuals, households and communities to gain control over their own lives and resources. Greater control requires greater access to knowledge that ensures food security and economic well being as well as the tools that enable this access.

By augmenting the process of information exchange and reducing the transaction costs, ICT is instrumental in increasing productivity, efficiency, competitiveness and growth in all spheres of human life. The potential benefits of ICTs, however, can be harnessed only if the technology diffuses across different sectors of the society. Unfortunately, we are living in the era of the 'digital divide' where half of the world population has never made even a telephone call (Annan 2002). It is argued that the future of the South to harness the benefits of the ongoing technological revolution in the North, places developing countries' populations at the ever increasing disadvantage in a globalising world (Bridges 2001).

So, how can technologies (both old and new) be harnessed for poverty reduction? According to the World Bank (1998) "recent development thinking has been based on the assumption that markets work well enough to ensure development and alleviate poverty". My understanding of information constraints suggests that societies require policies and institutions to facilitate the acquisition,

adaptation and dissemination of knowledge, and to mitigate information failures, especially as they affect the poor. This requires effective consideration to be taken on the role of knowledge in poverty reduction in order to facilitate greater access to and use of ICTs through policy planning. It is important to realise that rural areas hold substantial human and natural potential to realise development goals by harnessing knowledge. ICTs can play a greater role i.e. not just raising more people out of poverty but raising the poorest people out of poverty. An understanding of these peoples' information needs is important because it will form the basis on which poverty reduction efforts will be anchored.

Information needs of the rural poor

It is important to emphasise that ICTs only provide new mechanisms for handling an already existing resource i.e. information. Therefore to understand their application in rural areas, one must first understand the information needs of rural populations. Some of these needs include: Growing crops; fertilizers- prices, usage, benefits from use, quantities, mixes; pesticides- which ones to use and how; plant diseases and how to combat them; farming methods; marketing of farm products- how, where, and how to get best prices; product storage- when and how; veterinary services- where to get them; human health diseases -malnutrition, dysentery, AIDS, cancer, blindness, pneumonia etc. their causes, symptoms and treatment and how to avoid them; family planning, pregnancy, pre and post natal care; childcare; education, IT education, e-learning opportunities, opportunities for higher study; local NGOs- especially those geared towards poverty reduction; experiences in other countries of using ICTs e.g India, Bangladesh; leadership development; how to find resources; drugs and drug abuse; old age care, old age homes, government schemes; transportation, licensing; housewife issues, women's development; savings and loans- where to get credit; enterprise development; skills development; and sanitation among others.

Arnstein (2002).

This is a multiplicity of information needs and they touch on every aspect of an individual well being. For the urban rich, the information can easily be obtained from various sources such as libraries and other information centres, that the poor might not have access. Therefore availing the information to the rural poor is an important step towards poverty reduction. This is because a person who is healthy (free from disease) will be strong enough to work in the farm, and if he has the right and relevant information on various farming issues, he will produce enough for not just consumption (fighting hunger) but also for sale (fighting poverty).

Studying user needs therefore is an important step towards successful rural deployment of ICTs. It ensures that: extensive information needs are prioritized; sources of information are identified and located; responsibility is assigned to appropriate people to acquire information; and adequate support structures are activated that will be able to translate information into opportunities for improved well-being.

The potential role of ICTs in poverty reduction

The range of information and communication technologies is increasing all the time and "there is a convergence between the new technologies and conventional media" (Michiels and Van Crowder 2001). This rapid and ongoing convergence means that devices such as digital cameras, digital video cameras and players, personal digital assistants, slide projectors and mobile telephones are also compatible with more traditional media such as radio (digital, satellite), television (cable, digital, satellite). Thus most devices can now be linked to others to share and exchange information and allow it to be used in such a way that they can also be categorised as ICTs. Even books are being incorporated into ICTs either through the potential for informal web publishing or more formal

digital book publishing with designated readers or 'e-books'. ICTs, therefore, are an expanding assembly of technologies that can be used to collect, store and share information between people using multiple devices and multiple media.

Telecentres

The potential of ICTs can fully be realised through telecentres that will bring together these technologies for public access. A telecentre is an integrated information and communication facility that houses a combination of both new and not-so new ICTs (e.g. television, video, facsimile, telephone, computers with Internet connectivity, and sometimes books). This type of facility in which a number of different information and communication technologies are housed and used in an integrated manner is seen as the modern telecentre and is called a multipurpose telecentre. There is, however, a certain variety in the form, facilities, and functions available at telecentres, from the simple telecentre with only one or two telephones and no link to the World Wide Web, to a centre with numerous telephones, facsimile machines, printers, and computers connected to the Internet. Telecentres provide public access to communication and information for economic, social and cultural development or telecommunication and information services for a range of developmental aims. The notion of universal access, which is based on Article 19 of the "Universal Declaration of Human Rights" has provided fodder for the expansion of information and communication services to all without discrimination. Telecentres can be potent instruments in the struggle for universal access especially in poor countries and environments.

The nomenclature of telecentres is coloured by differences in geography and purpose. Telecentres are also known as Public Access Points and a large number of other names: *Telecentre, telecottage, telekiosk, teleboutique, phone shop, infocentre, digital clubhouse, multi-purpose access centre, community technology centre (CTC), multi-purpose community telecentre (MCT), community access centre, multi-purpose community centre (MPCC), community media centre (CMC)* or *community learning centre (CLC), community multi-media centre, electronic village hall, tele-village or cybercafé,* and the list goes on (Etta and Parvyn-Wamahiu 2003).

Ownership and management patterns in addition to primary purpose also confer other layers of differentiation on telecentres and on the taxonomy. Simple telecentres are popular in Senegal, whereas multipurpose (community) telecentres are a recent creation of development agencies and, although their financial sustainability is an ongoing concern, their validity and utility have become firmly rooted. To date the telecentre idea has been generally adopted in the United States, Canada and Australia, whereas in Africa and Asia the notion is still only taking root having commenced in the latter half of the 1990s. Telecentres can now be found in Benin, Mali, Mozambique, Uganda, Tanzania and South Africa.

A telecentre will basically consist of a computer terminal(s) loaded with databases of useful information relating to government services, such as agricultural extension, health and the police that contain relevant contact details for each village. A group of volunteers can be identified to run these villages (preferably from the same village). Support and daily information bulletins (summary of main news stories from local newspapers, local whether report, prices of produce collected from local markets every morning) can then be provided through a central hub, through emails to the networked villages. Telecentres therefore afford people the opportunity to use computers, networks, copiers, scanners, telephones, Audio-Visual resources for information searching and retrieval. These services should be available at an affordable fee.

Examples of novel ICT use

(a) In Togo and Mauritius, call centres now provide telephone support services for international companies with customers in Europe and North America. Callers do not realise they are calling Mauritius or Togo. They pick up the phone, dial a local number, and are routed to one of these countries where the operators provide the support that they require.

(b) Many African craft makers are selling their wares on the world-wide-web, supported by NGOs such as PeopleLink.

(c) The government of Lesotho recently declared that all announcements for cabinet and committee meetings would be made only by email.

(d) Some governments, such as those in South Africa, Algeria, and Tunisia, now provide immediate global access to tender offers via the Internet.

(e) In South Africa, the results of blood tests are being transmitted to remote clinics that are not connected to the national telecommunications grid via mobile telephone text messages.

(f) In Uganda a local women's organisation the Council for the Economic Empowerment of Women in Africa (CEEWA) posts prices and market information for agricultural commodities regularly on its web site and women in rural trading centres can access this information at a number of community telecentres to determine which market to take their wares and what to charge for them.

(g) In Senegal local fishing communities are using Personal Digital Assistants to improve distribution and marketing of their products and improving their incomes.

In this scenario, it is not a question of whose reality information reflects but who is able to make use of that information and for what purpose. The following section highlights areas where ICTs play an important role in poverty reduction.

Economic productivity

ICTs can be used for strategic market exploitation on behalf of the poor. For instance, women, the most disadvantaged in rural areas, can be given mobile telephones which they can use to charge users a small fee for making and receiving phone calls. These ladies can then pay back for the phones in installments. This kind of initiative has worked well in Bangladesh, through the Grameen Bank. Its founder and director, Yunus, initiated a cellular phone project, dubbed the Grameen Phone company, which would put a mobile phone in some 45,000 villages, giving residents access to ICT. Each mobile phone is acquired by an individual through a small loan from the bank. This phone becomes a village telephone service provider, earning income for the owner besides providing a much needed utility to the community. This can be followed up with an experimental village computer and internet program which can provide e-mail and internet services to villagers (Flor 2001).

Developing markets

ICTs can enable the rural poor to extend far beyond their existing and traditional markets. They can use the internet for example to market their products and services beyond their boundaries and thereby overcome one of the important barriers to global competitiveness facing developing countries. Advertising can be done on the internet cheaply and reach a wider scope (market). Rural populations could handle transactions such as orders for their products over the web while payment

for the same could be handled off-line. It has proved cheaper and faster to trade online than on paper-based medium, telephone or fax. This is what is called electronic commerce (e-commerce). It could enable the rural communities to access global market information and open up new regional and global markets that fetch better prices and increase earnings, thus reducing poverty e.g. where can I sell my tomatoes among other questions.

Developing a global partnership for development

Developing of global partnerships is Millennium Development Goal number 8, and yet a very important one in poverty reduction strategies. The rural poor can form partnerships with other groups thus developing their businesses (this they will do if they have information on potential partners). For example in India, an agribusiness company called EID Parry, is using Hewlett Packard (HP) products to equip its sales points as small telecentres for farmers termed as 'Parry's Corners'. These Corners are run as businesses by farmers or their families and the company is developing a website that can be accessed in the centres to provide information on the full range of their products and services. The company also runs a sugarcane mill and uses ICTs to improve communications with the farmers contracted to supply sugarcane by providing access to extension advice and information on their accounts. As a company, HP has a vision of the future where technology is accessible to everyone in the world as a means to learn, work and benefit from information. Its mission is to close the gap between technology empowered communities and the technology excluded communities (Chapman and Slaymaker 2002).

Empowerment of the rural poor

Information acts as a catalyst of reducing poverty in poor rural communities. ICTs can empower rural communities and give them "a voice" that permits them to contribute to the development process. With ICTs, they can acquire the capacity to improve their living standards and become motivated through training and dialogue with others to a level where they make decisions for their own development (Balit, 1998). Giving rural populations a voice means giving them a seat at the table to express their views and opinions and become part of the decision making process. The approach should be participatory and could lead to improved policy formulation and execution.

Improved policy formulation and strategies, however, require "an educated and informed populace in order to reduce poverty, excessive population growth, environmental degradation and other factors that are most often the direct causes of poverty" (FAO, 1998). ICTs have the potential to penetrate under-serviced areas and enhance education through distance learning (e-learning), facilitate development of relevant local content and faster delivery of information on technical assistance and basic human needs such as food, agriculture, health and water. Rural communities can also interact with other communities, families, neighbours, suppliers, customers and intermediaries. This is one way of educating rural communities. The Internet can also enable the remotest village to access regular and reliable information from a global library (the web). This is possible with electronic villages.

The focus of the e-village is on enabling the villagers to access information that is useful to them for their daily lives and to discover opportunities for improving their income generation. The database and daily bulletins are intended only to act as catalysts, to reduce the sense of isolation, and to extend public information to those who need it most. These e-villages can be called decentralised knowledge centres that can be developed to reflect local priorities and needs. Initiatives such as this will enable villagers to discover uses for information that extend beyond what was originally intended. Agricultural prices for example, sent to the villages, will enable farmers to deal with middlemen that come to the villages to purchase their produce. For instance, the Village Internet Programme of the Grameen Bank in Bangladesh aims to promote poverty alleviation by reducing migration from

villages to cities, creating IT-related job opportunities for the rural poor, and by creating familiarity with computers among the rural population of the country (Grameen Bank, 1998). This information acts as a catalyst for empowerment.

Managing, storing and sharing information

ICTs offer unprecedented information storage capacity, increases in processing power and speed, coupled with dramatic reduction in costs. They can facilitate the improvement of existing information management processes by improving ease of access, transparency, accountability, efficiency, speed of delivery and provide new information sharing opportunities through affordability, availability and ease of use. They can also help address good governance concerns by improving existing formal information systems operated by local government and development agencies. They can facilitate cataloguing, storing and sharing of locally relevant information. The multimedia capabilities of the technologies offer the potential for storage and presentation of information in formats more appropriate to local contexts and therefore encourage the integration of different systems. Above all, ICTs offer potential for decentralisation of information systems, decreasing dependency and empowering the rural poor by devolving control over information and knowledge.

Access to public information

Freedom of information (FOI) is a necessary precondition for an effective and participative democratic society in which government is both transparent and accountable to its citizens. Moreover, passing legislation on access to information opens a dialogue between the government and the people. Further, without full information, the citizen cannot criticise policy and could be devoid of a voice and the right to put forward views that contribute to political and social change. FOI therefore promotes an open and accountable administration. It gives the citizen the right to establish what the government does and the basis for taking certain actions. The absence of FOI legislation could be the reason for what has been viewed as endemic corruption in most African countries – Kenya included. Njagih (2005) points out that FOI enhances the responsibility of the media to inform by providing guarantees for 'whistle blowers' and people who may disclose official information of public interest without threats of liabilities. A properly implemented FOI law should provide a strong foundation for accountability, transparency, democratic governance, poverty eradication, elimination of corruption and efficient use or resources. These are all attributes of development.

Access to information by the populace can help people to become well informed and to contribute positively to governance through democratic participation. Similarly, access to information can enable people to make realistic demands on the government and assist in creating jobs and understanding their rights, obligations and responsibilities.

By harnessing the power of information, the public can bring force to bear on authorities to provide new and better responses to vital long-standing issues such as poverty reduction, education among others. ICTs will no doubt facilitate this free flow of information.

Diffusion of indigenous knowledge

Indigenous knowledge is the local knowledge – knowledge that is unique to every culture or society. It is related to the entire culture of a people, including its identity and spiritual and religious beliefs. While some scientists and development planners may see indigenous knowledge as a means of resolving certain development problems, indigenous people see it as part of their overall culture, vital to their survival as peoples (Dewes 1993). It is the basis for local level decision making in poverty reduction in rural communities (Warren 1993). In the view of Dewes (1993), the knowledge of local people is an enabling component of poverty reduction. He compares indigenous knowledge to the

feathers of a bird, since 'a bird can only fly if it has feathers', so a community can fight poverty if it harnesses and manages its own indigenous knowledge systems. According to Flavier et al. (1995), indigenous knowledge is the information base for society, which facilitates communication and decision-making.

Thus indigenous knowledge systems enable economically poor people to survive. However, these knowledge systems have often remained isolated and unconnected and there is need to establish a network for indigenous knowledge, preferably and if possible, in the vernacular language. This is where ICTs, through the e-villages would play an important role[2]. The World Bank is at the fore front of promoting the use of indigenous knowledge and that is why it devoted the 1998 World Development Report to exploring the extent to which developing countries should invest in developing indigenous knowledge rather than making effective use of the rapidly increasing stock of global knowledge (World Bank, 1999).

ICTs for local governance

Lack of information, and thus accountability weakens the responsiveness and accountability of government institutions and creates an environment where corruption can flourish. Conversely, when the poor have information about the programmes and resources of government, their rights as citizens, and the match between the declared objectives of government and the actual delivery of services and resources, they have greater opportunities to exert pressure and hold government accountable. Therefore, using ICTs by the public sector and the promotion of online delivery of services will ensure improved accessibility to government by all citizens. Databases on local government assets and community resources will facilitate decision making among local government executives and policy making among members of local councils. Geographical Information Systems (GIS) for instance make invaluable tools for land use planning and local government investments. One of these tools is poverty maps[3]. Poverty mapping combines geographically referenced survey and census data to generate poverty and inequality profiles at low levels of aggregation. Additionally, poverty maps based on highly disaggregated data, serve benchmarking as well as monitoring and evaluation purposes. Hence they are important tools in guiding spending for governments. They can improve economic policy and facilitate the policy making process.

Multimedia applications e.g. digital video can be effective media for citizens' education and process documentation of government success stories. The use of ICTs therefore would accelerate the democratic process, enabling the poor overcome the barriers of development and helping them enjoy the conditions for effective participation, enlightened understanding and the setting of political agenda. ICTs can be used by governments to offer services to citizens right to the village door steps through the e-villages highlighted above. Governments that have harnessed ICTs do not require people to physically go to poling stations. The citizens can just vote from the convenience of their rooms, courtesy of ICTs! This improves the reach, enhances the base, minimises processing costs, increases transparency and reduces poverty.

Decision-making process - Sound decision making is dependent upon the availability of comprehensive, timely and up-to-date information. For example, the use of the geographical information systems to plan location of rural facilities or identify disaster prone areas will be very useful. Problems facing developing countries demonstrate the need for informed researchers, planners, policy makers, development workers and farmers among others. Information is also needed to facilitate the development and implementation of food security policies. For the government to be able to make a decision about a certain project in a rural area, she must have information about the status of that area.

Creating employment – Through the establishment of rural information centres, ICTs can create employment opportunities in rural areas by hiring telecentre managers, subject matter specialists, information managers, translators and information technology technicians. Such centres help to bridge the gap between urban and rural communities and thereby reduce the rural-urban migration problem. The centres can also provide training and those trained may become small-scale entrepreneurs.

Educational development

Much excitement in international circles has been generated by the educational application of ICTs. In fact, some sectors are of the opinion that ICT can only effectively combat poverty directly through education (e-learning) – open learning on the web and distance education. The development of human resources capable of responding to the demands of the information age through education and lifelong learning is necessary in poverty reduction. Foremost in the educational agenda should be the development of ICT manpower that is versed not only with hardware and software expertise but also with content development skills. A higher level ICT professional who looks into the social and strategic impact of the technology should be produced by the educational sector (Flor 2001).

Information sharing and awareness raising

ICTs are invaluable tools for information sharing and awareness raising within the wider development community, to combat poverty and advance the international development targets. Multilateral and bilateral development agencies can work more effectively with each other and their partners in developing countries. A broader range of views and voices from poor communities can be brought into the international debate on poverty and development. NGOs and civil society groups can network world-wide and collaborate more effectively. Citizens in developed countries can be more effectively exposed to the realities of poverty and importance of a concerted international response.

The above potential benefits of ICTs would not bring about any real transformation in rural society, unless adequate attention is given to the social and structural influences that affect both access and impacts.

Constraints

There are however some limitations and impediments which need to be addressed to ensure that ICTs have a positive impact on poverty.

Connectivity – this is crucial for without it the benefits of the new information and network age cannot be harnessed. But connectivity is often beyond the direct control of the rural poor. Connectivity relies on the telecommunications infrastructure, which is provided or controlled by nation states, their agencies, or licensed private operators.

Content and applications – this can be viewed as the blood that runs through the veins of connectivity or the electronic impulses travelling through a computer network. Local content is particularly valued and a monumental effort aimed at collecting, creating, collating, transforming, and uploading relevant content and applications should be supported and embarked upon. The greatest difficulty with the creation or transformation of locally relevant and available content is human capacity. This expertise and skill base need to be created, expanded and deepened across all social and occupational strata to improve the use, service delivery and applications available at telecentres.

Knowledge capture and power structures causing blockages/controlling information exchange Knowledge and information capture by local elites, large scale commercial farmers and traders can create inequalities in the rural areas. In India, an electronic centre was abandoned because it was located in the area where upper castes lived (Rao 2004). It is essential therefore to identify existing

and potential information blockages and design ICT interventions strategically to overcome them. One way of achieving this is to focus on improving access to basic public information resources, which are currently under-utilised.

Disadvantaged groups

Poor and disadvantaged groups, particularly women, may face special constraints in accessing ICTs and using them for their specific needs. Women tend to be poorer, face greater social constraints and are less likely to be educated or literate than men. They are likely to use ICTs in different ways, and have different information requirements, to men. Women are less likely to pay for access to ICTs, either because of lack of funds or because they lack control of household expenditure. Constraints on women's time or their movement outside of the home can also reduce their ability to access technologies. Similar constraints apply to other groups who are historical, ethnic or cultural reasons are particularly marginalised or disadvantaged.

Policy considerations – Developing countries lack not only information and communication policies, but also strategies that facilitate the harnessing of ICTs. This has aggravated the problem of accessibility and generation of information related to rural communities. Communication regulations which focus on licensing, competition acts and telecom codes are rigid while telecommunication tariffs and import duties on ICT equipment are very high. The situation is compounded by lack of political good will.

High telecommunication costs - The cost of basic internet remains a strong deterrent in rural areas. Although market liberalisation has led to the entry of several private sector Information Service Providers (ISPs), service provision is through state-owned telephone companies (such as TELKOM in Kenya), whose services are inadequate in terms of robustness, low bandwidth, congestion and noisy lines. All the investments in connectivity, content, and capacity development would ultimately be meaningless if the cost of services is such that they remain unpopular, unreachable, or unusable by the majority of rural poor.

Infrastructure - The telecommunication and electricity infrastructure in rural areas is poorly developed. These are areas where lack of transportation, illiteracy, access to information and language differences are common problems. Satellite and wireless technologies are largely developed around urban cities and even here, the infrastructure is often inadequate. There are problems of low bandwidth and there is a need for strengthening the internet backbone.

Inadequate human resources - To ensure more meaningful participation in rural development, training and capacity building must be an integral part of all ICT projects. The people have to be trained in the use, application and maintenance of ICTs before they become confident and comfortable enough to use them.

Way forward

The paper provides the following recommendations to ensure that the potential role of ICTs is realised in rural areas.

1. Governments need to create enabling environments that will foster the free flow of information and communication networks, the adoption of locally appropriate ICT tools, and the empowerment of the poor and disadvantaged through the use of these tools and networks. The government need to do so in close partnership with the poor themselves, the private sector and the civil society.

2. An appropriate enabling environment to allow for free flow of information should be created by governments. In many instances, restrictive broadcast regimes limit the variety of opinions and information that can be heard by the poor. Governments need to allow and encourage free expression and an independent media with diverse media ownership. For example, making radio licenses available for local and community radio stations can increase options for making broadcasting more appropriate to the needs of the communities. This will also promote the production of local content. Government policies to promote transparency and accountability such as freedom of information legislation can also be important (Marker et. al 2002).

3. Carrying out of user studies[4] regularly, so as to identify their information needs – both expressed and unexpressed. This will sensitise the government and assist policy makers to establish information systems that will address the needs.

4. Integration of available sources of information and ICTs to enhance the accessibility and visibility of the information needs.

5. Every development policy should include an information and communication component. This will strengthen the information and communication infrastructure in the country and facilitate the harnessing of ICTs.

6. Special attention should be paid to selecting the communication channels that are most appropriate, such as audio and visual channels. Radio is one such communication technology in that it is affordable and can be listened to while working. Communication programs must deal with the various economic and social issues.

7. Since wisdom and indigenous knowledge is rooted on culture, traditions, values and experience, the methods of communication and information exchange should be harnessed and complemented with ICTs (FAO, 1998). Technology mixes are an important factor in ensuring access to information in that they provide technologies which are adaptable to local conditions and requirements such as unreliable electricity, low literacy rates and so forth. They also allow for sharing, packaging and presentation in ways that the rural communities will understand.

8. Rural populations should be trained on the use of ICTs. Such training could be done through conferences, workshops or training of trainers' courses. People in rural communities of developed countries are already reaping the benefits of electronic distance education and developing countries could offer similar services through selected centres. Focus should be on such skills as how to use ICTs through practical and participatory approaches, content development and the transformation of content into multi-media formats.

9. Government programs in areas such as formulation of policies, eradication of poverty, combating HIV/AIDS, and so forth, should involve rural communities in defining the purpose, content and delivery of information in order to ensure that it is appropriate and practical.

10. Improvement of infrastructure - telecommunication and electricity. It can not be gainsaid either that the speed and global reach of the internet makes it a potentially powerful tool for people to share information about their causes or to find out about issues that have an impact on their lives. This can only be possible with improved telecommunication infrastructure.

11. ICTs cannot be imposed as another technology brought in from outside without any relevance to the local context and content. ICT projects need to build on the resources and knowledge of local communities. The focus needs to be on the role of ICTs in promoting communication that is relevant and addresses needs in the local context.

12. Telecommunications infrastructure should be seen and treated by governments as a growth area in which public and private investments ought to be encouraged.

13. National governments should create enabling environments through policies and policy instruments for the growth of telecentres. Laws should be supportive not prohibitive of developments in appropriate and practical technologies. For instance, import duties and taxes on information and communication equipment, e.g., computers as well as licenses to operate equipment, the spectrum and premises devoted to the development and delivery of information should be reasonable, realistic, easy to get and difficult to revoke.

Private sector IT and communications companies should consider forming creative partnerships with each other and with national governments on one hand and international development agencies and civil society organisations on the other to create cheaper products which would respond to the needs, assets and conditions of the communities served by and through telecentres. For example, a number of different service providers for say telephony, training, email, and photocopying could band together to set up and run Telecentres.

Conclusion

This paper set out to examine the potential role of ICTs in poverty reduction in rural areas. The paper has shown that indeed information (a resource that is already with us) is a critical factor for poverty reduction. The paper has also given an insight into the use of ICTs in the capture, storage, preservation and exchange of information for poverty reduction in the areas of economic productivity, market penetration, education, governance and indigenous knowledge management among others. The paper has also highlighted constraints to the full utilisation of ICTs and provided a way forward. It is therefore true that ICTs are the vehicles that can steer developing countries into achieving the Millennium Development Goals by the year 2015.

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