INFORMATION AND COMMUNICATION TECHNOLOGIES AS A TOOL FOR RURAL POVERTY REDUCTION

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ABSTRACT

Information is not a magic cure for hunger or poverty. However, the information at the right time can help in funding a solution. ICT includes or whole range of technologies that facilitate communication and the processing and transmission of information by electronic means from conventional radio and landline to computers, internet and mobile phones. There is much emphasis now in the development community of government, donors and NGOs to push for the widespread rollout of community access to ICTs as a tool for direct poverty relief. ICT will be an invaluable tool for those striving to meet the Millennium Development Goals of eradication poverty, equality and empowerment, education, training, jobs, political participation and the rest. Without the application of ICT, there will be no adequate measurement or tracking of progress on all the MDGs. It is only through modern survey and statistical techniques, heavily dependent on the advances of ICT, that one will be able to track employment, income, and other statistics relevant for growth and economic development. It is only by the application of ICT that there can be hope of adequate unraveling of the complex causal patterns of discrimination and inequalities. This paper argues that ICT used in the right way and purposes will enhance economic growth and poverty alleviation. It provides priority areas of attention, keys to successful ICTS for poverty derivation, and also suggests the way forward
Key words: ICT, poverty, growth, education, development

INTRODUCTION

Today, food security in the developing world, especially in South Asia, and sub-Saharan Africa, is dependent less on resource – intensive agriculture and more on knowledge intensity. Millions of farm families and the rural poor need the right information and knowledge for their very survival (Udin, 2005). ICT can play as role in bringing about happiness to these people. Many developing countries remain poor largely because they had let the industrial revolution pass them by. They can all afford to miss the information technology revolution. Digital happiness requires technology and techno-infrastructure, context value –added information, gender sensitivity and perhaps, partnership (Udin, 2005). The poor are often illiterates and have no assets like land, livestock, fishpond or productive skills. Often they survive on uncertain wage labour. Therefore building assets has to be the major goal of any poverty alleviation effort. Facilitating a paradigm shift from unskilled to skilled work is basic to poverty reduction and a healthy and productive life.

Information and communication technologies (ICTs) play a major role in all aspects of national life; in politics, in economic life, as well as in social and cultural development. It is rapidly transforming our lives, the way we do business, access information and services

communicate with each other and entertain ourselves. It fuels the global economy. It also relates to human rights, helping, at best, to support freedom of expression and right to information according to artiele 19 of the Universal Declaration of Human Rights (Kelles – Vutenea, 2003). ICT should be used as a vehicle for imparting market driven skills through the pedagogic methodology of learning by doing (Udin, 2005). ICT skills cannot be imparted in a vacuum. Knowledge and skill transfer needs to be synchronized with access to inputs necessary to apply the knowledge. For example, there may be a need for easy and timely access to credit. Content should receive as much importance as connectivity. It must be user- and demand-driven. The following priority areas should be addressed:

❖ Weather – short, medium and long-range weather forecasts should be converted into location and farming system specific action plans.

❖ Water – it is not only the most basic need but also the center of sustainable agriculture and essential for a productive and healthy life. It is ultimately linked to health, agriculture, energy, biodiversity and ecosystem maintenance. The threat of water famines looms large and it is possible that future wars will be fought for resources (Gerster, and Zimmer mann, 2003).

❖ Energy – it is central to the lives of the poor and affects them in terms of food, water, health, income and jobs. Access to energy is important for poverty alleviation. Access to affordable and renewable energy services is critical for increasing agricultural productivity, encouraging economic activity, generating employment and income opportunities, and improving the quality of life.

❖ Health – Good health is basic to a productive and happy life. We should aim to create zones where preventable diseases are totally eradicated.

❖ Agricultural (production, processing, marketing) – agriculture is central to sustainable development. Most of the poor live in rural areas and are dependent on agriculture (including crop and animal husbanding, fisheries, forestry, and agro-processing).

❖ Biodiversity and ecosystem management – the ecosystem generates a wide range of goods and services are based on biological products and processes. Biodiversity is the feedstock of the biotechnology industry.

ICTs in this context are defined as the set of activities that facilitate the capturing, storage, processing, transmission and display of information by electronic means (World Bank, 2002). ICTs include telegraph, telecommunications, radio, television, computers, internet services and wireless technologies. While radio and telephone have a long history demonstrating their utility in developing countries, modern ICTs like the internet or wireless mobile phones are just starting to prove their usefulness in developing countries. Modern ICTs have four advantages compared to the old ones;

1. Interactivity, allowing for a two-way communication flow
2. Permanent availability;
3. Global reach and;
4. Reduced costs.

THE CONCEPT OF POVERTY

There are multiple ways of defining poverty. UNDP categorizes poverty in the following way (UNDP 2002);

- Income poverty, the lack of sufficient income to satisfy essential do
- Capability poverty, a deprivation in the range of things people do
- And participation poverty, a deprivation in the range of thing people can be (UNDP, 2002)

The first Millennium Development Goal aims to halve the number of people living in extreme poverty between 1990 and 2015. Yet in Sub-Sahara Africa (SSA) poverty rate rose from 47 percent in 1990 to 49 percent in 1999, the number of people living in extreme poverty increasing by 74 million (World Bank, 2003). To understand the impact of ICTs for poverty reduction it is important to look at the nature of extreme poverty in poor countries. According to the 2000 World Bank report on World Development indicators poor countries are countries where more than one third of the population lives on less than one US dollar per day (World Bank 2000 cited by Kenny 2002). The main characteristics of poor people are;

- Very low incomes: GNP per capita in SSA is less than 50% of the world average
- Subsistence, unskilled way labour as the dominant income source,
- Physical goods (especially food) as the dominant consumption, good,
- Low education and high illiteracy: SSA lags farthest behind, with only 51% primary education completion rate (% of relevant age group), girls enrolment in primary and secondary education in SSA is 82% (as % of boys enrolment),
- Minority language group status: 53% of population not speaking official language compared to 36% on global average
- High amount of rural population: 67% compared to 54% on global average, living in the population – sparse areas (World Bank, 2002; World Bank 2003).

Poverty stems from a situation where gross inequality of assets persists because of vested interests and entrenched power structures. Markets can provoke collusions that block the potential benefits of competition to the poor, and the disadvantaged can easily fall outside distributional coalitions. Markets can thus be biased in favour of more affluent and powerful social groups and against poor and disadvantaged groups (Leyshon and Thrift 1997). Such biased coalitions are considered as the most significant case of inequality within societies. The level of the playing field is not even for the poor. Even under otherwise ideal market conditions, the poor may end up paying more, earn less, and they face a number of constraints, to an extent not experience by others. (Bowles 1999).

KEY TO SUCCESSFUL ICT FOR POVERTY REDUCTION

The poor have to be at the centre of poverty reduction efforts. Technologies used must be adequate to the skills of the poor in order to exploit their potential effectively. Content should receive ad much attention as connectivity – it must be people centered, demand – driven and in local language.

❖ Attempts to use information communication technologies (ICTs) for poverty reduction are more effective when embedded and synchronized with other policies and resources. A conducive environment, which includes freedom of expression, competitive markets, independent regulators, a universal service fund and other elements, is key. National poverty reduction strategies or sector specific strategies for example, health or god governance allow for a targeted use of ICTs embedded in these other efforts. In order to make use of information provided by ICTs, other resources must be available, e.g. job opportunities or access to credit or health services.

❖ Ownership by the local communities, partnership and networking are key to effective poverty reduction programmes; donors should not look for implements of their visions but for partner with their own vision and encourage and support them or implementing it

❖ Give poor people a voice in decision making processes on all levels which affect their lives. Local – information needs; priority areas for content are health, agriculture, weather, access to services. Women as key figures in information management deserve special attention. National – conducive environment for freedom of oppression, regulations for community radios, pro-poor service liveness and integration of information needs in poverty reduction strategies.

ICTs ROLE IN VARIOUS POVERTY SECTORS

The first nexus between ICTs and rural poverty is economic growth itself. Countries with vigorous growth rates overall are associated with lower poverty, and rapid diffusion of ICTs is increasingly seen as essential to accelerating growth. Thus rapid diffusion of ICTs that can spur productivity growth should be a high priority for developing countries.

Relative lack of literacy and numeracy typically characterize the poor; as does lack of access to accurate price, technical and other information relevant to the profitability of their business decisions and their integration with markets (Chowdhury, 2001). Illiteracy and lack of education breed social and cultural isolation, and the poor, who are often in remote areas, are further handicapped by limited availability of public information that the non poor take for granted (for instance, information about health and sanitation hazards; public transportation schedules; rights to public gravity – flow irrigation systems; and natural disasters). Today, more than ever before, having access to relevant, timely, adequate, and accurate information is critical if the poor are to make viable business, health, and safety decisions that can enable them to escape poverty (Chowdhury, et al, 2001).

ICTs IN ECONOMIC INTERVENTIONS

Information and communication technology, as a sector can create some employment opportunities directly to the poor both in the manufacturing of hardware and software. Because of the low educational levels and skills of the poor, we can expect that there are more employment opportunities in the services sector. Using ICTs in pursuit of development goals allows countries to achieve a wide diffusion of benefits from ICTs, which, in the end, will benefit broad based economics growth, too (UNDP, 2001). In the interest of direct

poverty reduction, ICTs plays a more important role in enhancing the activities of the poor and increasing their productivity; by increasing their access to market information or lowering the transaction costs of poor farmers and traders (kelles – Vutanen, 2003). ICTs can be used to increase efficiency, competitiveness, and market access for developing country firms. ICTs can also change and invigorate old occupations and add new public services. Poor people are often unaware of their rights, entitlements and availability of various government schemes and extension services. Through info-kiosks or even with the help to mobile phones, farmers can assess information on market prices or on extension services and workers can get information on available jobs and minimum wages. Timing is also crucial when it comes to the sale of produce. But such interventions can be successful only when accompanied with other supporting infrastructure such as access roads, storage facilities and competitive markets, including global market. ICTs can also play a major role in helping to monitor food security related (weather, droughts, crop failures, pests etc), and to inform government on impending food scarcities. ICT can therefore have a major role in reducing the impact of natural disaster on the poor low-income countries.

EDUCATION AND HUMAN RESOURCES DEVELOPMENT

ICTs integration in primary, secondary and tertiary education is one major goal of ICTs projects. One prominent project is the school net initiative that aims to connect schools to the internet and to train teachers in developing countries. They operate in partnership with the private sector, governments, NGOs and the donor community. In South Africa for example, where school net is focusing on historically disadvantaged schools, almost 3000 schools are already involved in the imitative. (Spencer 2003).

ICTs impact on distance education, which is currently most relevant to poverty reduction. E-learning enhances the access to education for those who have access to ICTs reducing several constraints that distance education has faced in the past: lack of interactivity, long development cycles, lack of flexibility of materials and insufficient support mechanism for learners (UNESCO 1996). In tertiary education access to online journals and to other information through the World Wide Web has revolutionized research possibilities in countries with limited resources.

ICTs/INTERNET AS GROWTH ENGINES

The ICTs industry is a growing sector in most countries and can be a substantial growth engine in most developed and rapidly changing developing countries, as showcased in Nigeria or Ghana. The Nigeria software industry has the potential of a $6 billion industry and could surpass the contributions from the oil industry (Giannini, 2005). It is critical to support indigenous software development and evolve national policies where indigenous software companies are given first consideration for national projects which are software-driven. One example can again be taken from Nigeria, where a local software provider recently won a national tender for the provision of university management software (Giannini, 2005).

Some argue that 'new ICTs such as mobile telephony contribute to increasing the gap between the "haves" and the 'have not's. One could strongly argue that this is not the case. Statistics show that

4.6 billion people, almost 67% the world population, are mobile subscribers against 1.5 billion internet users. Recent estimates show that while 6.8% of people in African are internet users according to a latest report from Ovum Research, mobile subscribers in African have reached 448.1 million (54% of the total population) and are expected to reach 561 million by 2012. In African, many countries have completely skipped the landline and have moved directly to mobile phones telecommunications. This makes mobile phones the first modern telecommunication infrastructure of any kind in this continent allowing those previously excluded to take an active part in improving their livelihood, thanks to the affordable and different pricing schemes of mobile services. (Samii, 2010). For those living in developed countries, the mobile phone started off as status symbol. But today, the mobile phone has revolutionized the lives of millions of urban and rural poor by connecting and involving them in viable economic activities.

Studies such as the Global Information Technology Report 2008-2009 commissioned by the World Economic Forum shows how "mobile telephony has proven instrumental in raising prosperity and reducing poverty in developing countries, where it has boomed in recent years, thanks also to a number of facilitating factors, including an infrastructure fairly easy to deploy, a market generally open to new entrants, and the decreasing costs of mobile handsets and communication per minute, among others". This report makes the case that mobile telecommunication has indeed had a positive disruptive impact on life in many developing economies, especially in rural areas (WEF, 2010).

A 2005 London Business School study also found that "for every additional 10 mobile phones per 100 people, a country's gross domestic product (GDP) rises 0.5 percent". For the 1.05 billion rural poor people living on US $ 1.25 or less, the mobile phone is far from being a flashing gadget but represents a viable way for improving their lives. For them mobile telephony has turned out to be a catalyst for economic growth by enabling small entrepreneurs to have direct access to market intelligence, by providing employment opportunities in the tertiary and services sector, creating opportunities for public and private sector to invest and modernize infrastructure. Mobile telephony is providing poor rural people with a point of contact allowing them to take part in the economic system and enter in the job market. It has allowed small businesses previously excluded to participate in the economic system. For producers, access to reliable market information is a key ingredient to increase income. In the past they relied on government to provide market information.

Today, agricultural markets are far from being well organized and transaction chains are long, while the volumes of goods are often small and of varied quality, and prices are highly unstable. For example, the fishers of the Tamarin Community under the IFAD funded Rural Diversification Programme on the Islands of Mauritius do not have direct access to the fish market and as a result are exclude from the market. However, they use their mobile phone to inform buyers of their daily catch and to take orders. This way they do not overfish and are sure that they will sell their daily catch. This has led not only to economic efficiencies but also to protecting the fish stock which in turn has a positive impact on the lagoon's ecosystem. At the same time, the fishers use their mobile phone to keep in touch will their

families, something that previously they could not do, and to get weather updates (Samii, 2010).

Furthermore, small producers trading in rural areas in Africa face enormous challenges such as lack of access to reliable and up –to date market information, lack of transportation infrastructure and competition. Without market information, small producers are vulnerable to unscrupulous traders and middle – men giving them prices at below market rates. This may lead the producers to be reluctant to diversify into different products for fear of not finding a profitable market for their output (Small, 2010). The relatively affordable air-time of mobile phones has made transfer and exchange of knowledge easy and affordable. For example, in many parts of the world, mobile phones are used to disseminate a wide variety of information ranging from market information to weather forecasts. This information dissemination is also happening by blending the formal and informal services as is the case of First Mile Project in Tanzania. These services provide a wide variety of SMS services ranging from commodity price to harvest tips, information on disease outbreaks, weather reports, transport and trading offers. As a result poor rural people can use their mobile phone both to directly communicate with buyers and also to access commodity prices via SMS.

ICTs can help poor rural people if the focus is on people and their needs and not on the technology. They can be vital for reducing rural poverty and can improve rural livelihoods only if they are appropriate, sensible and meet the requirements of the rural poor so that as a tool they can increase their bargaining and purchasing power. ICTs and more specifically mobile telephony can continue to contribute to MDGI targets if we use participatory approaches to find out and understand the needs and challenges of the rural poor, if national poverty reduction strategies systematically include adoption of appropriate ICTs, if there is a commitment to build the capacity of communities and local organization into the communication process.

The information needs of the rural poor depend, among other things, on geography and the stage of agricultural transformation at which a country finds itself. Asia, for example, is clearly much further along than Africa in terms of the shift from mono cropping to a diversified agriculture. As agriculture diversifies, production changers from monoculture stapes to mainly irrigated, high – value horticulture, aquaculture, animal husbandry and poultry production, and floriculture. The marketing cycles of these products are shorter than those for traditional crops from the standpoint of smallholder producers and need tighter coordination with buyers (Chowdhury, 2001). This situation puts a significant premium on accurate, real-time information. As producers undertake these activities on a wider scale and as nationwide distribution system begins to come of age, ICTs can play a greater role in the business processes that create and mobilize robust supply chains. Appropriate policies will be required to ameliorate the significant market failures that are bound to hobble the market integration of smallholders in such technology-rich efforts. With out these policies, a new kind of urban bias arises, generating inequality and instability in developing countries.

Even smallholder agriculturalists must participate in an increasingly integrated global economy characterized by greater use of ICTs. Globalization will be accompanied by more intense competition and redefined business processes with an accent on much greater use of ICTs. ICT powerhouse will harness high-and computing in their efforts to develop designer crops and achieve just-in-time marketing and storage of farm crops (Chowdhury, et al, 2001).

ICTs can help the smallholder farmers compete in this global, information-driven marketplace by;
- Giving policy makers access to real-time market information and best-practice insights and providing smallholder farmers with the latest information about public interventions in food and agriculture markets;
- Improving the profitability of business decisions and the associated returns to labour of small fishermen and farmers traders, and other small producers by providing adequate, up-to sate information, for example, on grain prices, possible supply shocks, and new or improved production techniques;
- Reducing private and public search and transactions costs;
- Fostering diversification of the rural economy;
- Saving lives by mounting early-warning information systems and introducing internet-based healthcare solutions and diagnosis;
- Using the web to improve the education, training, and income-earning potential of the poor in developing countries.
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BRINGING ICTS WITHIN REACH OF SMALLHOLDER FARMERS
The following policies have the potential to bring the benefits of ICTs to smallholder farmers:
- ❖ Create a congenial climate for high rates of investments including b private enterprises, in telecommunications and information infrastructure that provide rural public call offices and ICT-enabled communication centers on the broadcast basis;
- ❖ Invest in telecommunication companies and internet connectivity to the point of making them economically viable commodities;
- ❖ Wire farmers into connectivity, archive indigenous knowledge related to farm extension, convert it into local vernacular, and populate an email network with farmers interested in receiving farm extension online;
- ❖ Host regular updates of prices of benchmark farm commodities for key terminal markets in government web sites, and make them available for downloading;
- ❖ Provide smallholder farmers with leading-edge computer hardware, enabling applications that improve the productivity of the smallholder farmer and promote form friendly web content; and
- ❖ Wire rural schools into the internet, exposing children to computerization, to demystify technology and make computer laboratories such schools into community learning hubs where children learn computing during regular hours and parents learn computing after-hours as continuing education students.

REVIEW OF SOME ICT SUCCESS STORIES

Smallholder agriculturists often have strong latent demand for production and marketing information and may not be able to reach their economic potential without that information. The poor who do have access to ICTS are using them develop highly customized marketing strategies. This is especially true with wireless phones and the internet. For example, in the rural phones programme run by Grameen phone in Bangladesh, the poor typically use cell-phone access as a production input (for example to keep in touch with market developments relating to perishable goods). Such access has a considerable effect on the poor's production surpluses (Yunus, 2001). This kind of use is not confined to south Asia. In Laos, Cambodia, while call phone-purchases were motivated mainly by social needs (getting in touch with loved ones), economic uses (such as keeping abreast of the latest output and input prices, and exchange rates) were important too.

ICT can provide tools for the conservation of local knowledge which meets increased interest for exploitation. The farmers' rights information service that provides, among other information, a taxonomy of plants and details on usage, along with photographs and diagrams have been developed in India to serve as a knowledge centre. The Kisan (farmer) credit card scheme enables farmers to obtain easy and timely credit. Village women and men are provided training in several microenterprises, such as mushroom activation, ornamental fish rearing, setting up of community-man-aged gene banks, seed banks, and grain banks, production of handmade paper from banana waste, production of biopesteides and so on (Harris, 2004).

Women in these villages form self-help groups and borrow money from banks to lend among themselves for setting up and running micro-enterprises. The return rate is often more than 100 percent, meaning they return the loan ahead of time. So far there has not been a single instance of default. So far there has not been a single instance of default. People may be poor, but they are honest. In contrast, in the corporate sector there have been many cases of defaulting and bad debts. (Udin, 2005).

Fishermen in coastal villages near Pondicherry, India are provided with wave height forecasts from information downloaded from a U.S Navy website. The wave height information is put on the notice board of the local knowledge centers as well as broadcast over a public address system so everyone in the village would hear. Ever since this service was started, there has not been a single death in the sea.

In a remote village in central Tamil Nadu, volunteers of our knowledge centre have perfected a novel method of bringing in literacy to a remote village community. They use a touch screen computer, digital camera and a CD writer to prepare lessons for each individual. People in the family and objects in the home are photographed and burnt on a CD-ROM. One –word descriptions are then written, letter by letter, using flash software and each letter and the word is articulated by the volunteer. When the illiterate person inserts his own CD, the pictures appear on the screen and as he/she touches the pictures on the screen, the words start forming slow enough for the person to follow and the sound byte starts playing too. The

net result is multimedia education of the person. More than 150 people have been made functionally literates in this village. Now they are able to read sign boards, price lists displayed in shops, and transact business in shops, post offices (Udin, 2005; Gerster, 2003).

Right now in Africa, there is an experiment with internet radio, testing exchange of information with rural communities in Africa through the Open knowledge network (OKN) project in collaboration with one world international. Nigeria should embrace this opportunity to empower she citizens, especially rural directors and farmers. This will go a long way in reducing the level of poverty among her citizenry.

CONCLUSION

To sum up, information and communication technologies can be use for poverty reduction, but we need to be cautions. It is much more than mere use of technology. It is more a question of working with people giving them a sense of ownership, building partnerships with a number of experts, and institutions, and creating a large and inclusive network. In the end, technology is just an enabler if used in the right way and for the right purposes. Without ICTs, the poor will find it difficult to integrate themselves with unfolding economic processes and global markets, making their escape from the vicious cycle of poverty even more uncertain. But their loss would also translate into national and global economic loss. Investing in and widespread diffusion of ICTs therefore would be a high priority to developing countries.

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