INNOVATION AND TECHNOLOGY FOR POVERTY ERADICATION

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1. Background

1.1 Introducing the International Institute for Communication and Development (IICD)

The International Institute for Communication and Development (IICD) is a not-for-profit organization specialized in the use of modern information and communications technology (ICT) for sustainable human and economic development. IICD was founded in 1996, when the information technology industry was booming and it was a common belief that merely having access to modern information and communications technology was the key to increased socioeconomic development. Our mission statement was thus to "[…] *Close the digital gap between the North and the South*." But if there is one thing that we have learned over the past years, it is this: it is not the technology itself that makes the difference but rather the people who own it and apply it. The broad range of information and communications technologies (ICT) available, whether email, Internet, mobile telephone, or community radio, enables people to access information and to communicate, allowing them to make more informed decisions and connect with others. But it is what people *do* with the opportunities created by ICT that leads to greater socioeconomic development. Consequently, the needs and demands of people, and their creativity and competence to make use of the opportunities enabled by new technology, lie at the heart of our work. Our role is straightforward: as an organization, we ensure that adequate ICT is made accessible to people and help them to develop their capacity so that they can get the most out of it.

Our experience and knowledge of applying ICT to development is based on 15 years of experience of working in the field in ten different countries in Africa, Latin America and the Caribbean. Our activities focus on agricultural livelihoods, economic development, and improving the education and health sectors where we implement technical and social innovations that create and enhance development opportunities.

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1.2 Understanding ICT

When we talk about the use of ICT for development we are referring to the appropriate and sustainable use of information, communication and supporting technologies, both modern (PC, Internet, mobile phone) and traditional (radio, television), to support the development objectives of people and organizations.

In our opinion, all three components of the term "information and communications technology" add value to the development process.

- *Information*
  Access to information enables people to make informed decisions which are beneficial for both their private and professional lives. Information that is readily available needs to be based on local needs and should be accessible in ways that people can understand. Where not available, information needs to be developed – preferably by the target group itself. The target group should not only consist of consumers, but should also include those who generate information.

- *Communication*
  Communication enables people to join forces, share views and ideas, and co-create solutions, thereby enabling them to address their own individual problems. To be effective, new forms of communication need to build on, rather than replace, traditional means of communication. Traditional means of communication include meetings, radio, television and fixed telephony.

- *Technology*
  Technology helps us to gather, access and disseminate information more quickly. It also enables people to communicate faster, more efficiently and involve more people in the process. Technologies that support information gathering, storage and dissemination include a wide range of offline and online applications including databases, Web applications and social-networking tools.

1.3 Access to technology in relation to poverty eradication

Poverty is more than just material deprivation. It also involves aspects such as lack of access to quality schooling and healthcare, vulnerability in the face of external events, or being excluded from decision-making processes. The contribution of health and education to poverty eradication was re-confirmed by the Human Development Report 2010 of the UNDRP. The report states, "Countries became top performers on the Human Development

Index through two broad routes, but more often through exceptional progress in health and education than though growth."[1]

IICD believes that ICT can be used to accelerate the eradication of poverty both in the more traditional sense of promoting economic opportunities, and in the modern sense, by catalyzing awareness and empowerment as well as sector strengthening.

Developing countries still hardly benefit at all from modern ICT. Despite the rapid development of the Internet, access is still expensive and unreliable in most developing countries, particularly in the rural areas. In both Africa and Latin America, user rates are still below five percent in rural areas.

Mobile telephony is penetrating African and Latin American society far more rapidly than the Internet. According to data obtained from the International Telecom Union (ITU), average global penetration stood at 68 subscriptions per 100 inhabitants at the end of 2009. Penetration in both developed and transition economies now exceeds 100 subscriptions per 100 inhabitants, while in developing countries it stands at 58.[2]

Despite this rapid expansion of mobile services, less than five percent of all communication carried out is related to business or development issues. Merely having access to the Internet and mobile services does not guarantee a useful application for specific development purposes. Internet, for example, can only offer a limited amount of relevant information to a farmer in Uganda, a health worker in Mali or a teacher in Bolivia. Having access to *relevant* content and knowing *where* and *how* to find and connect with others who may be able to help you are equally important.

In other words, we cannot measure the success of ICT for development on the spread of technology in developing countries alone. It is the overall progress towards reaching the Millennium Development Goals (MDGs) in relation to the spread of such technologies that gives a more accurate picture of whether or not ICT-for-development activities have delivered.

1.4 Technical and social innovation

Innovation plays an important role in IICD's work. Firstly, because working with technologies means that one works with tools that constantly renew themselves, thereby creating fresh opportunities to address development challenges. Secondly, because introducing new technologies results in changes in processes and organizations. In this way, ICT becomes a tool and a driver for social innovation too.

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[1] 'Human Development Report 2010 - 20th Anniversary Edition. The Real Wealth of Nations: Pathways to Human Development'. *UNDP, New York, 2010. Page 46*

[2] *Information Economy Report 2010: 'ICT, Enterprises and Poverty Alleviation.'* United Nations Publication. UNCTAD. New York and Geneva, 2010

For IICD, innovation is the first attempt to try something new and put it into practice, whether it involves introducing new technologies or initiating a change of processes to achieve better results.

In terms of time, IICD spends little time on the actual development of innovative products. Innovative technologies are used within projects, but more often it is a combination of various well-known robust technologies that is innovative in the way in which it is applied to the local context (Internet-mobile applications, Internet-community radio, etc). The impact we are after is something we aim for by integrating technology on a larger scale (leveraging programs) rather than by the diffusion of innovative technology on a large scale.

Although ICT in itself is already widely accepted as a powerful tool for poverty eradication, its added value for bringing about social innovation is not yet fully appreciated. Social innovation is the best construct for understanding – and producing – lasting social change. According to Wikipedia, social innovation is all about "[..] New strategies, concepts, ideas and organizations that meet social needs of all kinds – from working conditions and education to community development and health – and that extend and strengthen civil society."

In a development context, social innovation can best be explained as a novel solution to a social problem that is more effective, efficient, sustainable, or just than existing solutions. The added value of social innovation is that it accrues primarily to society as a whole rather than to private individuals.[3]

For us at IICD, social innovation is our core business. We are aiming for a lasting social change using social innovation that in many cases has been created by applying information and communications technology. In the open book of social innovation[4] the authors identified six stages in the social development process that take ideas from inception to impact: prompts, proposals, prototypes, sustaining, scaling and systemic change. For years IICD has been working following these stages, even if using another terminology: identification, formulation, piloting, embedding, leveraging and systemic change.

We are involved in processes of innovation that address social problems in developing countries, helping mainly professionals such as teachers, health workers and farmers, to change their livelihood. We help them in particular to become more effective and/or efficient through the use of ICT. Connecting these people through networks helps them to reach out to many more.

A farmer, for example, who lives high up in the mountains may not be able to move to a less isolated place but, as a direct result of having better access to information and being

[3] Rediscovering Social Innovation, by James A Phills Jr, Kriss Deiglmeier & Dale T. Miller, Stanford social innovation review. Fall 2008.
[4] Open book of social innovation by Robin Murray, Julie Caulier-Grice and Geoff Mulgan, the young foundation - NESTA March 2010.

connected with a diverse range of people, he may be less dependent on the people around him. He is now able to make his own, better-informed decisions.

In the education sector, one outcome of social innovation could be that young people living in sparsely populated areas with few amenities might stand a better chance on the career market because, although there are no training courses available in their neighborhood, distance education helps them to educate themselves. Another outcome of social innovation may also be the development of new (content) services that generate additional local, better-paid jobs.

Social innovation in the health sector could potentially result in a completely new mindset regarding traditional methodologies to cure people from illnesses thanks to better information. Or rural hospitals, often situated in remote areas, will stand a better chance of employing highly skilled medical workers. Thanks to the Internet, they have even more possibilities to connect and exchange information with their peers, feel supported and continue to learn from consulting other medical specialists.

Farmers will be able to negotiate better prices or produce more crops. Better education of both boys and girls and improved access to good-quality healthcare in remote areas ultimately leads to a skilled and healthy workforce, more self-employed people and more jobs: all of which helps to eradicate poverty.

2 Innovative Practices that Eradicate Poverty

2.1 Using ICT to improve agricultural livelihoods and economic development

Over three billion people – almost half of the world's population – currently live on less than $2.50 a day. Stimulating economic development and helping people to improve their livelihoods therefore remains one of the most important goals in the reduction of poverty. According to the *Rural Poverty Report 2010* of the United Nations International Fund for Agricultural Development, 70 percent of the world's poor live in rural areas where most of them make a living from subsistence farming or as farm laborers. To reduce poverty, one therefore needs to focus on rural poverty and the challenges that small-scale entrepreneurs such as farmers have to face.

Although obstacles to economic development vary and poverty always has to be examined within the context of a specific country, the underlying causes can often be boiled down to a combination of three key factors: a poor education system, underperforming industries and a poor business climate. Particularly with regard to underperforming industries, ICT can make all the difference.

Applying ICT to economic development

ICT interventions in the economic development field allow us to reach out to grassroots producers and producer groups to increase individual- or group- level income or

employment opportunities, thereby directly contributing to poverty reduction. ICT interventions can be used to:

- *Access market and price information*
  Access to market and price information strengthens the bargaining position of individual producers, and of producer and entrepreneurial organizations such as cooperatives, unions and federations. Using ICT is particularly interesting in terms of gaining access to market information via the combined use of the Internet, radio and mobile phones, allowing producers to negotiate higher prices and earn more. In addition to this, access to information relating to quality management, certification and product tracking, and tracing the production process, will be included. Using ICT also helps producers' organizations to gain more regular and timely access to information about inputs and production methods that will increase productivity and thereby raise their level of income. In this area, particular attention will be paid to providing information that is relevant for female producers and entrepreneurs and to taking measures to ensure that women can also access the program's skills development activities.

- *Create employment opportunities*
  Within the segment of producer organizations, small- to medium-sized enterprises (SMEs) and entrepreneurs will also be helped, to improve their business skills and to generate employment opportunities in the ICT sector by including youths, service providers and small businesses in business skills training and ICT capacity-building trajectories. This will reduce poverty among (male and female) youths and adults.

Box 1 - Case: Chawama Youth Project in Lusaka, Zambia

In Zambia, close to Lusaka, the capital, the Chawama Township houses many thousands of people of all ages and origins. The largest part of Chawama's population is made up of young people, the majority of whom are unskilled, unemployed and poor. With Zambia's economy currently in the doldrums, there is little that the government can do for them. The government is equally constrained by the large number of unfinished programs it also has to deal with. If the youths do not stand on their own two feet and do something to help themselves, no one will come to their rescue.

The Chawama Youth Project supports a Skills Training Center. Here, young people receive vocational training and learn skills that will eventually enable them to find employment or start up their own businesses. The center has trained over 300 people in different subjects, including carpentry and joinery, tailoring and design, welding and metal fabrication, auto mechanics, house wiring and electrical issues, among others. IICD has helped the center to set up an ICT center that will enable youths and other clients from the local community to access the Internet and other computer-based services easily. The young people are also receiving training in basic ICT skills.

The owners of this project, together with those of the Ndola Resource Center which has implemented a similar project, are now using their experience and lessons learned to build the ICT capacity of 16 Youth Resource Centers (YRC) all over the country at the request of the Ministry of Sports, Youth and Child Development (MSYCD) and the National Youth Development Council (NYDC) as part of the implementation of the National Youth Policy (2006). This policy promotes the use of ICT for Youth Development.

The Youth Resource Center model has been developed to provide a hybrid "not-for-profit Youth Resource Center" (YRC) and a for-profit telecenter. The purpose is to provide information about sustainable community development information and business services to the youth groups. The YRCs will provide access to Internet-enabled computers, printers, copiers, telephones, television and radios. In addition, there will be an adjoining library with books and daily newspapers and magazines. The YRCs will deploy sustainable connectivity solutions and will be linked to the government portal. The Youth Resource Centers will be an integral part of Zambia's e-governance structure.

2.2 Using ICT to improve access to, and quality of, education

Despite the fact that access to education is considered to be a basic human right, many countries still struggle with poor-quality education, a shortage of teachers, high levels of illiteracy, large numbers of children prematurely dropping out of school because they have to look after their families, and the high cost of education.

Access to education can be hampered by a number of very different factors. The gender balance is generally tilted, with fewer girls receiving education than boys. People in rural areas have less access to the educational system than their peers in urban areas. In addition, the educational sector has, until recently, received rather low levels of political support. This has led to chronic under-funding of the education sector, as a result of which educational establishments across the board are usually ill equipped and understaffed. To compound this situation further, the education provided in most schools has not been adjusted to, and therefore does not correspond with, the needs of the national labor market.

Teacher training too is often below par, with few possibilities for teachers to update their skills and few incentives for young people to choose teaching as a career in the first place. Those who do enter the teaching profession often leave because of the poor wages and difficult working conditions.

Only a very small percentage of students enroll at secondary level and even fewer go on to follow tertiary education. Finally, the devastating impact of HIV/AIDS on the education sector in developing countries cannot be overstated, from the shortage of teachers to the large numbers of children who are forced to leave school prematurely either to stay at home with sick relatives or to take up work to sustain their families.

The international community is trying to redress the situation via international strategic frameworks and goals such as UNESCO's Education for All declaration and the Millennium Development Goals. The latter resulted in the Dakar Framework for Action, which commits governments to provide basic-quality education for all by 2015. Although these initiatives focus strongly on improving primary education, increasing attention is now being focused too on secondary and tertiary education and teacher training.

Applying ICT to the education sector

The application of ICT within the education sector focuses on five different aspects:

1. *Efficiency*
   ICT can help to improve management and administration of both schools and governing bodies by streamlining information and providing quick and easy access to data.
2. *Teaching methodologies*
   ICT and digitized learning materials can help teachers to breathe new life into their teaching methods. Using multimedia in the classroom makes it more interesting for pupils to follow the lesson, makes classes as a whole more attractive and, for subjects where the facilities and equipment are

often missing, makes it easier to perform scientific experiments – for example, in physics – while at the same time making the experiments more appealing and easier to understand. It should be emphasized that in order to fully benefit from the teachers' newly acquired ICT skills, teachers should also be given training in pedagogical skills to enable them to get the best out of using online and offline tools and teaching materials in the classroom.

3. *Quality of educational materials*
   In addition, teachers often have to work with substandard, outdated learning materials. ICT can help overcome this problem by enabling them to develop their own teaching materials with the help of the Internet and multimedia. Via the Internet, teachers can find sources to update their existing teaching materials and use multimedia to present this to their pupils in a more attractive and – increasingly important – in a more *interactive* format. The learning materials are easily distributed and can be made available to all pupils by making them accessible online or offline.
4. *Computer literacy*
   Youths receive training at school or at vocational training centers in computer proficiency and/or maintenance and repair. Computer skills will increase their chances on the job market and prepare them for the knowledge-based economy of the 21st century.
5. *Access to education*
   ICT also enables people living in remote areas with few schools and training centers to receive a decent education or vocational training. With the help of the Internet, email and online/offline learning materials, many people are able to participate in distance education.

IICD's interventions in the education sector reach out to teachers at both primary and secondary school level as well as to those in vocational training, which in turn provides learners with better learning opportunities that fit their needs. This directly contributes to an increase in quality and equity within the education system.

Box 2: Education program, Bolivia

Since 2002, a group of NGOs in Bolivia has supported a large number of primary and secondary schools with computer labs. Teachers are trained to develop interactive games for math and language lessons for the younger classes and interactive CDs for intercultural education for the higher classes. The (very limited) monthly financial contributions made by parents help to sustain the ICT services. Since 2004, the NGOs and IICD have been sharing their experiences and have jointly advised the Ministry of Education on a national ICT for education program. The program started in 2007 with basket funding support led by the Netherlands Embassy. Now the program has been expanded in 165 schools, with continued support in training and advice from NGOs and IICD. The intention is to extend this to more than 1000 schools, covering the province and later the country.

2.3 Using ICT to improve the quality of and access to healthcare

Poor health and poverty often go hand in hand. Poverty breeds ill health, which in turn renders people unable to fully take part in any economic activities that would improve their standard of living. In developing countries, access to high-quality healthcare that could potentially help break this vicious circle is limited. A number of factors lead to poor healthcare, including inadequate medical training and a shortage of health professionals. Poor data management of both patient records and new medical knowledge further undermine the quality of care. In remote areas, there are few trained professionals, and information about disease prevention and proper sanitation techniques is scarce. Medical expertise is often out of reach, as most specialists are concentrated in the larger areas such as the main towns and capital cities. Last but not least, according to the World Health Organization, around 95 percent of medical technology in developing countries is imported. Astonishingly, 50 percent of equipment in these countries is not in use. This is either due to a lack of maintenance, a lack of suitable training or because the equipment is too sophisticated. This void has a great impact on the effective provision of healthcare in developing countries.

The World Health Organization (WHO) developed a Framework of Actions that aims to promote a common understanding of what a health system is how to strengthen it. The approach of this framework was to define a discrete number of "building blocks" that make up the system. These building blocks are: service delivery; health workforce; information; medical products, vaccines and technologies; financing; and leadership and governance (stewardship).

- Good *health services* are those which deliver effective, safe, quality personal and non-personal health interventions to those who need them, when and where needed, with minimum waste of resources.
- A well-performing *health workforce* is one that works in ways that are responsive, fair and efficient to achieve the best possible health outcomes given the available resources and circumstances (i.e., sufficient staff who are fairly distributed, competent, responsive and productive).
- A well-functioning *health information* system is one that ensures the production, analysis, dissemination and use of reliable and timely information on health determinants, health system performance and health status.
- A well-functioning *health system* ensures equitable access to essential medical products, vaccines and technologies of assured quality, safety, efficacy and cost-effectiveness, and their scientifically sound and cost-effective use.
- A good *health financing system* raises adequate funds for health in ways that ensure people can use the services as needed and are protected from financial catastrophe or impoverishment associated with having to pay for them. It provides incentives for providers and users to be efficient.
- *Leadership and governance* involves ensuring that strategic policy frameworks exist and are combined with effective oversight, coalition building, a regulatory framework, attention to system design, and accountability.

Applying ICT to the health sector

ICT can help to improve the various health systems in place in the different building blocks. Based on our own empirical experience in the field, we have seen that ICT can help to improve the health sector in several different ways. In particular, it can be used to:

1. *Improve effectiveness and efficiency*
   One of the six top priorities of the World Health Organization (WHO) is to reach poor and underserved populations with health services. Only then will health improvement contribute to poverty eradication. Health systems in many parts of the world are unable to reach out to the poor. Improving access to and efficiency of health services is therefore one of IICD's priorities in the health sector. Hospitals and healthcare centers can benefit from ICT by using it to streamline processes and make information transparent and easily accessible. Digitizing vital information such as the administration of patient records and stock supplies not only saves precious time for health workers; it also provides valuable management information for hospital managers, enabling them to run the hospital more efficiently and effectively. Government officials responsible for healthcare may also benefit from having timely and accurate data at their fingertips as this will help them to better plan and prepare their health policies.

2. *Facilitate professional development and continuous medical education (CME)*
   Health staff, especially those working in remote, isolated areas, often struggles to stay up to date with the latest medical developments. Tools like the Internet and email help them to stay in touch with their peers and to exchange information. Audio-conferencing, CD-ROMs and personal digital assistants (PDAs) can also help to keep health staff informed and facilitate access to knowledge and information.

3. *Provide telemedicine*
   ICT can also be applied to improve the delivery of and access to healthcare services, especially in areas where distance is a critical factor. Healthcare professionals can benefit from ICT by using it to exchange information with medical specialists for better diagnoses and treatments and for the prevention of disease and injuries. The Internet also allows healthcare professionals to continue their education by following online courses and accessing the latest information on medical research.

ICT interventions in the health sector are particularly useful for community-based organizations that employ health workers and caregivers as it enables them to help individuals or communities obtain access to adequate health services. This directly reduces their vulnerability and increases people's well-being.

Box 3: Case: innovating the health sector in Tanzania

In Tanzania, 70 percent of the population lives in the rural areas where access to healthcare is still poor. The epicenter of healthcare expertise and resources remains in the cities. One heavy burden on the health sector is the lack of professionally trained health workers, especially in the remote areas. For health staff it is difficult to have access to training courses and medical and public health information resources such as journals in order to stay up to date with medical developments. Health facilities suffer from inefficient management practices due to staff shortages, high staff turnover rates, and an inadequate utilization of health data. The quality of information does not meet the requirements. Collecting data is also time-consuming.

Experiences with using ICT to improve efficiency within the sector are scattered and little is shared within the sector. The IICD health program in Tanzania covers a wide range of activities to strengthen the sector and improve performance. The activities can be grouped into three types of intervention:

- *Supporting policymakers by creating a conducive policy environment*
  Health plays a crucial role in poverty eradication since it is a key sector for development.

  IICD is supporting the Tanzanian Ministry of Health in its efforts to develop an ICT policy and to implement an ICT strategy for the health sector. Chief executives realize the potential of ICT, but awareness and capacity at broader levels need to be increased.

- *Improving the management of and access to information and knowledge for better healthcare delivery by health staff and/or health students*
  IICD is supporting health institutions in the district of Mwanza as well as the health centers of the Evangelical Lutheran Church of Tanzania (ELCT) – which provides 15 percent of the health services in Tanzania – in order to help implement a customized Health Management Information System (HMIS). The HMIS collects health data that can be used by the hospital management and which also meets the needs of the MTUHA; the government registration system for the health sector. The HMIS provides timely and accurate information, resulting in better healthcare planning, improved diagnoses, and more patients getting access to health services.
- *Ensuring Continuous Medical Education (CME)*
  IICD also supports professional development and continuous medical education for the health workers of ELCT by offering tools such as the Internet, audio-conferencing, CD-ROMs and personal digital assistants. ICT is also used for telemedicine; doctors can now consult their peers online via email and by using scanned images of x-rays for an expert diagnosis of complicated medical cases, exchanging information about the treatment and prevention of diseases and injuries.
- *Improving access to information for patients and/or people in the community*
  ICT is used to support the dissemination of information for health education and health campaigns.

The ICT health program in Tanzania currently reaches out to approximately 6,000 users directly and 600,000 beneficiaries indirectly.

3. Challenges and Opportunities for ICT4D Programs

In the 15 years that IICD has been carrying out development projects and programs based on ICT, we have gained valuable insights into how ICT is best used and what we as an

organization can do to enable local organizations and individuals to benefit from ICT. To learn from our own experiences, and in preparation for the new multi-year strategy to develop large-scale ICT-for-development programs, IICD decided to carry out a thorough analysis of the work it has done so far including the strengths and weaknesses of our partners, civil society organizations, in performing ICT-enabled development activities successfully in their respective countries.

The analysis was based on the experiences and data that IICD and its partners had gathered over the years as well as interviews conducted in our focal countries. We wanted to know what aspects should be taken into account when rolling out our (new) larger ICT-for-development programs. What has helped to make it a success or a failure in recent years?

The analysis revealed a number of strengths and weaknesses, particularly among civil society organizations – in this case, African and Latin American NGOs working in the education, health or economic development sectors, concerning their capacity to carry out ICT-for-development programs. The analysis is based on the knowledge we gained in the following countries: Bolivia, Burkina Faso, Ecuador, Ethiopia, Ghana, Kenya, Malawi, Mali, Peru, Tanzania, Uganda and Zambia.

3.1 Economic development

For the lowest-income countries, the analysis indicated that using ICT to support productivity and market information should be the first priority when it comes to tackling the low income level of small-scale producers and entrepreneurs. With timely information in these areas, farmers and entrepreneurs can make more informed decisions, thus increasing their income and opportunities for employment.

The main issue affecting the success of ICT-for-development programs for entrepreneurs is the lack of organizational development among producers and entrepreneurial organizations. This is a common *weakness* in most countries, but particularly in Burkina Faso, Ethiopia, Ghana and Mali.

In countries with more developed and organized producers such as Bolivia, Ecuador, Ethiopia, Kenya, Mali, Peru and Zambia, there is an *opportunity* to deploy more advanced ICT applications to support the creation of added value to their products by expanding their export markets and helping them to certify their products.

Finally, particularly in the Latin American region, there is also a lot of scope for using ICT to support financial services, especially those that increase access to financial services for small-scale producers through the use of mobile service providers. Africa is rapidly taking this up too.

In terms of *strengths,* the analyses revealed that most countries already have strong, well-established producer organizations. Working with established producer organizations adds to the success of ICT-for-development activities since it is clear how and where ICT can be

applied to the organization and the organization is able to oversee the impact of ICT on procedures and processes within the organization. More and more producer organizations, especially in Bolivia, Burkina Faso and Ecuador, have started to provide Internet services as well. These organizations, including their grassroots branches, will be more inclined to experiment and adopt new ICT that can help them improve their production yields and services.

Secondly, civil society organizations in Bolivia, Ghana and Zambia have already implemented pilots in innovative market information systems using the Internet, radio and cellular services. This means that capacity is available in the country to help IICD roll out larger ICT-based development programs.

Thirdly, national rural finance umbrella organizations are well represented in Bolivia, Ecuador and Peru. The presence of these organizations in rural areas will help to extend financial services to the rural areas, with the help of ICT. It is a matter of providing the right ICT infrastructure to support the services that are already available. In addition, banks in Bolivia already use Internet access for banking transactions. This awareness and knowledge of how the financial sector can benefit from ICT will help local organizations to experiment with and adopt new ICT solutions to improve the quality of, and access to, financial services.

3.2 Education

In the countries where IICD and its partners work, partnering with local and national organizations has helped to identify the low quality of the education system and its inherent inequity as its two key weaknesses, with equity specifically failing in terms of the participation of women and girls. This not only applies to primary and secondary education, but also to vocational and teacher-training colleges.

Secondly, the experiences gained by civil society organizations demonstrated the important potential of ICT to improve the quality of education. While education partners see that ICT can address this, the challenge is to address the lack of knowledge and experience among teachers with effectively integrating pedagogy and ICT and overcoming the widespread resistance to change among decision-makers, particularly headmasters within the schools.

Both the analysis and the interviews conducted with the civil society organizations with which IICD and its partners work on the ground indicated that organizational development and the management of education institutions is weak. This makes it difficult to enhance the quality of the education system. Limited participation by parents and grassroots organizations is also affecting the financial and political support for the education community.

As a fourth weakness, it was found that knowledge sharing and strategic cooperation between education partners and the education community is still in the early stages.

Finally, civil society partners in education are not strong at lobbying for collaboration and resource mobilization with private sector partners and government – and consequently insufficient resources are allocated to upscaling the embedded implementation of ICT for education.

The analysis also brought a number of *strengths* to light, which should be taken into account for future ICT-based development activities in the education sector; for example, the fact that the majority of civil society organizations in the education sector focus strongly on innovation to improve their results and impact. These organizations are dedicated to securing better-quality education for the targeted learners.

Teachers have also shown an increased interest in, and demand for, integrating ICT into their teaching and learning strategies; they will therefore be open to the new technologies, which will in turn help with the overall adoption of ICT-based solutions and acceptance of changes following the introduction of ICT-solutions in the education sector. This eagerness to use ICT goes hand in hand with a positive attitude towards education.

There are many local experiences and lessons learned with regard to introducing computers in educational institutions that now support an effective integration of ICT in education. Not only teachers but also parents and parent teacher associations have an enormous and relentless demand for the introduction of ICT in education.

Governments, too, have given a lot more attention to developing ICT policies and strategies with civil society organizations for the education sector as a whole.

3.3 Health

In the health sector, civil society organizations and health facilities indicated that they lacked the capacity to monitor and report on their activities. Due to poor data gathering and processing, and poor communication systems, they found it difficult to hold the government accountable as a network of collaborating health actors.

Another *weakness* concerns the capacity of health facilities, especially in rural areas. Most health facilities in rural areas deal with substantial shortages in health staff and an overload of patients. Due to the unequal distribution of staff and services, the staff is overloaded and increasingly demotivated. Providing high-quality healthcare, and enough of it, is therefore hampered.

A third weakness observed by IICD's partners is the persistent fragmentation of civil society within the health sector. There are many community-based organizations; for example, women's groups, youth groups, support groups for persons living with HIV, and village health committees that act locally and are not linked to the other dispensaries and health clinics or the government authorities.

Finally, the health sector is highly dependent on external donor funding, which limits flexibility and prioritization on the basis of local priorities.

In terms of *strengths,* the analysis revealed that it is an advantage that civil society organizations provide a large part – from 30 to 50 percent – of the health services in our focal countries in Africa and Latin America, particularly the faith-based umbrella organizations.

Also beneficial is the fact that civil society organizations are often well-rooted in rural and remote areas, with a wide reach in the communities. They are strong in organizing and mobilizing large numbers of volunteers at the community level, particularly for social groups.

In addition to this, we have come to notice that the health staffs of civil society organizations are highly motivated to use ICT at all levels. Throughout the years in which we have supported them, most partner organizations have shown a proven interest in and orientation towards social innovation. They have all gained experience with ICT by using it in pilot projects that are either related to health insurance, performance-based financing, refining health management information systems, health education or community care.

Finally, most umbrella organizations have demonstrated a good working relationship with the Ministry of Health, which supports alignment with national health policies and strategies, expressed by agreements, service contracts or participation in working groups set up by the Ministries of Health.

3.4 Limiting success factors

Human capacities

As stated above, one of the major challenges is related to our capacity to engage the underserved. This is why we apply the following guiding principles in order to get results and make a strong impact:

- Demand-responsiveness;
- Local ownership;
- Capacity development and learning by doing;
- Building partnerships and multi-stakeholder involvement;
- Gender equity.

Applying these principles will allow us to truly reach out to the poor and help underserved people to get out of the poverty trap. The present article has shown that that is possible.

Accessibility

In many *developed countries* such as Finland and the Netherlands, the state has invested in research and infrastructure – and these "hyper-connected" states stand to benefit down the road. In many *developing countries,* the willingness to welcome new technologies in the service of economic growth and human development has generally prevailed over fears about how the Internet and mobile phones can be used for criminal purposes or to undermine the powers in place. Nevertheless, in many of these "partially connected" countries, sudden influx of connection technologies may threaten the status quo. Many of these countries have weak or failed central governments, underdeveloped economies, and populations that are mostly young, unskilled and unemployed. They are often open to the import and use of connection technologies because they see the potential for the creation of sustainable economies. But to overcome the fears, they will have to take a strong political stand to allow the dramatic changes that access to connectivity can bring about on the ground. In some countries, accessibility may be a political challenge.

Another dimension of accessibility is linked to the availability of energy to supply the ICT infrastructure. For this reason, an increasing number of ICT infrastructure solutions are being implemented together with an adapted energy source (solar, generator, etc). An integrated approach is needed with a decentralized energy source to ensure energetic independence.

The combination of different forms of ICT can provide solutions for reaching out to wider networks of poor users. Approaches may use computer databases and analytical power for centralizing knowledge before selecting and distributing the information requested through more widely diffused ICT such as mobile phones or community radio. Technology combinations illustrate that mobile telephony, radio, PCs and the Internet can act as complementary rather than competing solutions for the supply of information and communication.

Affordability

Another major challenge is the affordability of ICT. This was also underlined in the UNCTAD Information Economy Report 2010: "*ICT, enterprises and poverty alleviation.*[5]*"* It states that we should not underestimate that affordability is key to enabling ICT to be a motor for change. In order for poor people to benefit from greater access to ICT services, these services have to be affordable. "*The contribution of ICT to poverty reduction lies in their power to enable poor women and men to build 'livelihood assets' or more secure employment opportunities. We are witnessing a new dawn in the way new technologies can*

[5] *Information Economy Report 2010: 'ICT, Enterprises and Poverty Alleviation.'* United Nations Publication. UNCTAD. New York and Geneva, 2010

make a difference, even in the most remote places. The diffusion of some ICT – especially mobile phones – has improved dramatically, including in regions where many of the world's poor live and work. This translates into new micro-enterprises in different sectors, new services and new ways to market produce and other goods."

Relevant policies

In the same UNCTAD report, policies are considered to be key in ensuring that improved access to ICT leads to poverty reduction. "*The outcome depends on the context and on the environment in which ICT are introduced and used. Governments have a key role to play in devising policies that respond effectively to the specific needs of the beneficiaries – needs that differ among enterprises, between rural and urban areas, and between countries. The policy challenge is to take full advantage of the significant improvements in connectivity in ways that bring benefits to the poor."* Several recommendations have been made.

4 Future Prospects for ICT for Social Development

The ability of ICT to play a key role in human and economic development is now widely recognized. This was stated several times in the outcome document for the MDG Summit[6], which was adopted by consensus by the UN General Assembly on 22 September 2010.

MDG 2: Achieve universal primary education:

We commit ourselves to accelerating progress in achieving Millennium

Development Goal 2, including through: (e) Ensuring quality education and progression through the school system. This requires (…) ***harnessing the capabilities of information and communications technology (ICT).***

MDG3: Promoting global public health for all:

We commit ourselves to accelerating progress in promoting global public health for all, including through: (n) Further promoting research and development, knowledge-sharing and the ***provision and use of ICT for health****, including through facilitating affordable access by all countries, especially developing countries.*

4.1 The use of ICT as a tool for social development

So far, ICT has been simply used as a tool to improve efficiency in society and the economy at large: it has helped to streamline information, increase the speed of information exchange, increase calculations and strengthen capacity, etc.

[6] Keeping the promise: united to achieve the Millennium Development Goals. MDG summit Sept 2010

Yet, despite the fact that ICT is still not widely available in Africa, recent studies show that ICT can be used to give a tremendous boost to economic development on the African continent as well. A comprehensive international study investigating the correlation between changes in ICT investment levels and GDP growth across different regions shows that, as a result of ICT investments, the economic growth in Sub-Saharan Africa increased by about ten percent in the period 1995-2003 compared to the period 1989-1995. ICT has proved to be a key factor for improvements in different environments (public and private sectors, individuals, and groups) supporting new processes, and increasing efficiency, transparency and participation.[7] ICT has also had an instant impact on the quality of life of those using it, in both a concrete and direct way. From the radio to mobile phones, ICT makes the intersection and leveling of the global and local spheres possible by democratizing information flows. ICT leverages knowledge, which drives competitiveness and shapes economic growth patterns.[8] ICT is one of the four pillars of a knowledge economy, together with a sound economic and institutional regime, strong education base, and innovation systems.

For example, ICT can help reduce the gap between growth producers and subsistence producers; people who produce food primarily to feed their own families; not to sell it on the global market and make a profit. Subsistence-producers are overlooked in the formal global economy and have trouble benefitting from measures and opportunities to improve their production yields and incomes. Access to relevant information and credit is fundamental for subsistence farmers to be able to become growth producers.

Our analysis of the strengths and weaknesses of our own ICT-for-development programs has shown that a lot can still be gained from applying ICT as a tool to improve social sectors and economic development. With today's expertise and knowledge, and increased investments in the information infrastructure, there are plenty of opportunities to roll out new, large-scale ICT-for-development programs enabling large groups of people to improve their livelihoods and benefit from better healthcare and education.

4.2 ICT as a catalyst and driver for social development

As stated by James A. Phills Jr et al,[9] people often use the word *social* to describe a kind of value that is distinct from financial or economic value. Social value can be defined as the creation of benefits or the reduction of costs for society—through efforts to address social

[7] *Promoting aid effectiveness from the bottom up with ICT* by Caroline Figuères, Denise Senmartin and Hilde Eugelink. World Bank magazine "Development Outreach," March 2009.

[8] Building Knowledge Economies: Advanced Strategies for Development, summary at: http://web.worldbank.org/WBSITE/EXTERNAL/WBI/WBIPROGRAMS/KFDLP/0,,contentMDK:21437029~menuPK:1727232~pagePK:64156158~piPK:64152884~theSitePK:461198,00.html

[9] *Rediscovering Social Innovation*, by James A. Phills Jr, Kriss Deiglmeier & Dale T. Miller, Stanford social innovation review. Fall 2008.

needs and problems—in ways that go beyond the private gains and general benefits of market activity.

Many innovations create benefits for society, primarily through increasing employment, productivity, and economic growth. Some even generate social value above and beyond their obvious economic impact; for example, computers dramatically enhanced individual productivity, learning and creativity, and as such benefit not only individuals but also society as a whole – but that does not make a computer a social innovation. An innovation is truly social only if the balance is tilted toward social value: benefits to the public or to society as a whole, rather than private value; gains for entrepreneurs, investors, and ordinary (not disadvantaged) consumers. It is only when markets fail (in the case of public goods) that social innovation becomes important as a way to meet needs that would not otherwise be met and to create value that would not otherwise be created.

In this process, ICT is a catalyst to spark the change. At the same time, ICT has such a transformative power that when people start to use ICT they are difficult to stop. In that process, ICT is a driver for change.

From piloting to upscaling

There is much to gain from using ICT for social development. Despite its ability to transform, ICT has so far hardly been used at all to bring about social change. Examples abound of pilots, but as yet there are still too few upscaling programs. At IICD, we have been working for several years not only on piloting but also on sustaining. In recent years, IICD has also been working on the scaling-up and diffusion part of the social development process. From experience, we can say that scaling-up and diffusion are processes that need multi-stakeholder involvement – and this is where it becomes a bit more complex than just piloting. Getting several partners engaged is neither easy nor fast.

Social networks and media

Coalitions and networks are increasingly turning out to be key for successful and long-lasting changes. Where there is interaction between people, innovation is possible. ICT is very much instrumental in facilitating networks and bringing people together. For this reason, ICT can support the development of resilient businesses and social entrepreneurship in developing countries.

Just as entrepreneurs change the face of business, social entrepreneurs act as the change agents for society, seizing opportunities others miss and improving systems, inventing new approaches, and creating solutions to change society for the better. While a business entrepreneur might create entirely new industries, a social entrepreneur comes up with new solutions to social problems and then implements them on a large scale. Social entrepreneurs present ideas that are user-friendly, understandable, ethical, and engage widespread support in order to maximize the number of local people that will stand up,

seize their idea, and implement it. In other words, every leading social entrepreneur is a mass recruiter of local change-makers – a role model proving that citizens who channel their passion into action can do almost anything. In the traditional economy, people are seen as consumers or producers. In the social economy, a greater place is given to relationship, quality, trust, and social cohesion as key success factors. Social media are going to play a major role in creating unexpected interactions and large-scale social developments.