



ICTs for agricultural livelihoods

Impact and lessons learned from IICD supported activities

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Foreword

This booklet is part of a series of publications that highlight the lessons learned and achievements of the International Institute for Communication and Development (IICD) and its partners in using Information and Communication Technology (ICT) for development in various sectors and countries. The effects are related to objectives and targets set in the context of the international development agenda, especially the Millennium Development Goals (MDGs).

IICD has been promoting the use of ICTs to support agricultural livelihoods for several years. Agriculture is an important economic sector, since it provides income and food for a large segment of the population in developing countries. Intensification of production and increased market orientation are the main processes that can contribute to the future viability of the sector and create income for the people that depend on it.

The projects described in this booklet were carried out by IICD and its partners over a six-year period and provide examples of the many ways in which ICTs contribute to poverty alleviation in the agriculture sector. When developing projects, IICD follows a 'learning by doing' approach. In this booklet we want to share our experiences with partners in the North and the South – particularly with development partners, policymakers and ICT practitioners. Hereby IICD hopes to contribute to a better understanding of the opportunities of employing ICTs and their contribution to reaching the MDGs in the agricultural sector.

We want to thank all our partner organisations in the various countries who have worked with IICD to formulate and implement these projects. IICD partners play a crucial role and are highly motivated to contribute to poverty alleviation.

In addition we want to thank our partners in the North: Directorate-General for International Cooperation (DGIS), United Kingdom Department for International Development (DFID), Swiss Agency for Development Cooperation (SDC), Danish Ministry of Foreign Affairs (DANIDA), Catholic Organisation for Relief and Development Aid (Cordaid), Humanistic Institute for Development Cooperation (Hivos), Cap Gemini Ernst & Young and InterAccess, who assisted in funding the programme and sharing their knowledge.

Jac Stienen
Managing Director, IICD

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Executive summary

This booklet is part of a series of reports on the use of Information and Communication Technology (ICT) in various sectors. It describes experiences and achievements of the International Institute for Communication and Development (IICD) and its partners with using ICT to enhance agricultural livelihoods through thirty-five projects over six years in nine countries in Africa and Latin America.

The study is intended to provide guidance to organisations working in the agriculture sector. It is particularly meant for policymakers, ICT practitioners and donor agencies.

Expectations of the potential of ICT to reduce global poverty and contribute to realising the Millennium Development Goals (MDGs) are high, but the evidence base needs strengthening. With this study IICD hopes to contribute to a joint understanding of the use of ICT in support of agricultural development and rural poverty alleviation.

The projects presented in this booklet address a wide range of information-related problems of small-scale farmers in developing countries. These include lack of accurate information on prices and markets for agricultural products as well as limited access to information to solve problems in production- and marketing processes.

The projects are developed and implemented in a systematic, participatory and incremental manner. They are complemented by capacity building, monitoring and evaluation and knowledge sharing activities. Upscaling and mainstreaming of projects is promoted by supporting dialogues at organisational and national level to create a policy environment conducive for the use of ICT in agriculture.

The thirty-five projects supported by IICD are developed and implemented by a range of stakeholders including farmers' associations, agricultural cooperatives, non-governmental organisations (NGOs), research institutions and government agencies. An estimated 20,000 users directly participate in the projects via some 200 agricultural information centres in nine countries. Around 200,000 people benefit indirectly from the information disseminated through the projects.

Analysis of the impact of IICD-supported projects indicates that ICTs can contribute to achieving the first Millennium Development Goal to 'eradicate extreme hunger and poverty'¹ by raising the income of small-scale farmers and strengthening the agriculture sector. Overall, ICTs contribute to better access to prices, markets and production information.

¹ United Nations Millennium Declaration. United Nations Resolution 55/2, September 2000.



Farmers working with the SEND foundation, Salaga, Ghana

The projects reach predominantly lower-income users in rural areas and enhance their capacity to take informed decisions and strengthen their negotiation position.

Monitoring and Evaluation data indicate that 30% of the users are female while 70% are male. Extra efforts are required to achieve gender balance.

The majority of users are highly satisfied with the projects, which have raised their awareness on the use of ICT. Some 50% of persons involved in the projects indicate that they are more empowered, and 35% experience direct positive effects on their income.

Projects go through various phases. It takes time before the human capacity, tools and content are developed to yield economic benefits for end-users. An analysis of four projects indicates that after two years the levels of empowerment and economic impact have increased by some 20%.

Clear direct impact is registered by ICT projects focusing on price information and market access. Direct, but less strong, impact on poverty is found with projects supporting efficiency and sustainability of agricultural production and with projects focusing on political empowerment. Developing national policies that include the use of ICT and streamlining agriculture information systems can contribute to a more conducive environment for agriculture development and a potentially high, but indirect, impact on poverty alleviation.

Recommendations for implementation of projects and policy processes have been prepared to support future activities in realising the full potential of ICT in the development process. They are based on the lessons learned of IICD to date with project implementation and impact analysis of IICD supported activities in the agricultural sector.

1. Use a participatory and integrated project design

The participatory and systematic approach of IICD was positively evaluated by project users. The approach covers awareness raising, capacity development and a participatory monitoring system linked with knowledge sharing mechanisms. Specific recommendations are:

- a. Identify clearly the information needs
- b. Facilitate active participation of users in the formulation phase
- c. Monitor the profile of the target group and if necessary re-direct project activities
- d. Monitor the gender balance and ensure participation of women during formulation and implementation
- e. Ensure that the project is aligned with the core business of the implementing partner

f. Build in a budget for maintenance of ICT

g. Ensure project support for at least two-three years.

2. Foster Ownership

Ownership is crucial to the sustainability of development. Recommendations are the following:

- a. Take time to build relationships and develop a conducive working environment
- b. Negotiate conditions of the partnership including roles, tasks and outputs.

3. Ensure availability of relevant content

Content should address key needs of end-users. Price information is generally highly valued. Recommendations are the following:

- a. Provide information that addresses local needs. It should be context-specific, delivered timely and accurately and presented in an appropriate language and format
- b. Develop and disseminate local content complemented with information from government sources, civil society and research institutions and networks
- c. Carry out research of local socio-cultural attitudes towards information, communication and technology before implementation
- d. Track information-use by simple monitoring methods
- e. Focus initially on one-two types of information in order to build up a relevant information service for the specific target group
- f. Foster two-way information flows to validate content.

4. Include continued capacity development

As new technologies are a rather recent form of ICT adequate human capacity needs to be developed. Introducing ICT in organisations goes together with institutional changes. It is recommended to:

- a. Focus training on practical project-related tasks and the local situation
- b. Address technical and 'soft skills', including project management. Relevant components are the use and management of information, developing and maintaining ICT systems and the use of ICT in the organisation- and development process
- c. Continue capacity development efforts during the project
- d. Develop a mechanism for training and support to provide partners with access to knowledge and skills when external support ends.

5. Use various ICT options

Combining various ICTs can overcome problems of rural access. Options include Internet access through V-Sat systems or dial-up lines, local radio, two-way radio,

mobile telephone, use of multimedia and drama. A promising option is sharing connectivity costs among several users in a community (e.g. school, local government and health offices, agricultural information centre). Mobile phones should be considered among the other options available for disseminating information.

Specific recommendations are:

- a. Seek suitable connectivity solutions and combine new and traditional ICTs where appropriate
- b. Focus on the sustainability of ICT. Explore cost sharing options for satellite connectivity among various local groups. Fees from casual users may be used to subsidise services for farmers
- c. Monitor new developments in ICT both in hardware, connectivity and information systems.

6. Include learning and knowledge sharing mechanisms

Information and Communication Technology for Development (ICT4D) is a new and dynamic field and continued learning and sharing of experiences with peers and others is necessary. Much can be gained by documenting and sharing experiences among partner organisations.

Recommendations include:

- a. Document and share experiences on the impact with ICT in agriculture
- b. Develop mechanisms for learning between partners and other practitioners at various levels including:
 - a participatory monitoring and evaluation system that emphasises learning-by-doing
 - country knowledge and knowledge exchange networks for capturing and sharing lessons learned and innovations in the use of ICT4D
 - cross-country learning to allow exchange and synthesis of information between various countries. Direct exchanges between practitioners are to be combined with web-exchanges.

7. Integration of ICTs at organisation level

Projects require a certain time before they are well established. It is essential that successful projects are sustained by integrating them at institutional and sector level.

Recommendations are:

- a. Address sustainability from the project start and ensure integration in strategic objectives and implementation programmes
- b. Set realistic targets and be aware that projects go through various phases
- c. Start with content that is easy to produce and relevant for farmers and disseminate it via appropriate combinations of media. Meanwhile build capacity and infrastructure

for more advanced Internet-based systems to support agricultural livelihoods

- d. Involve decision makers of the partner organisation in the process.

8. Mainstreaming ICT in the agriculture sector

A conducive policy environment is necessary to foster the use of ICT to enhance rural livelihoods. Use of common standards and shared and compatible systems is necessary to make information easily accessible for end-users. Specific recommendations are:

- a. Raise awareness of governments and the international donor community on the potential impact of ICT on poverty alleviation and provide experiences
- b. Collect and document evidence of impact and on-the-ground experiences of ICT pilot projects as a basis for influencing and participating in the policy processes and integration of ICT in national policies and programmes
- c. Involve multi-stakeholder networks to bring experiences of ICT projects and end-user perspectives from the agricultural sector
- d. Foster national interaction in an international context to harmonise standards and systems for sharing agricultural information.

1. Introduction

This booklet explores the potential contribution of ICT to the livelihoods of small-scale farmers and the efficiency of the agriculture sector in developing countries. The experiences and lessons documented here are placed in the context of their contribution to the Millennium Development Goals (MDGs). The Goals are widely accepted targets for international development, and are generally used as a guiding framework for setting priorities by international donors and developing country governments.

ICTs are a relatively recent instrument in the fight to eliminate hunger and poverty. The World Bank in its 2002 Strategy Paper on ICT² states that 'information and communication technologies are a key input for economic development and growth. They offer opportunities for global integration while retaining the identity of traditional societies. ICT can increase the economic and social well-being of poor people, and empower individuals and communities. Finally ICT can enhance the effectiveness, efficiency, and transparency of the public sector including the delivery of social services.'

A general lesson from initiatives that employ ICT for development is that successes are possible, but that programs must be designed and implemented with care. Early enthusiasm and claims that ICT would prove to be a panacea for development problems led to a number of false starts that have given ICT rather a bad reputation in mainstream development circles. 'After years of debate in the field of development about rusting tractors or failed infrastructure projects, and years of experience built up in participatory communications, it feels as though exactly the same mistakes and shortcomings are being replicated in the rush to make the benefits of new ICTs available to all. Stories abound of government or NGO sponsored telecentres lying empty, equipment abandoned or stolen or being used only by the wealthy. And yet participatory theories developed out of the questions raised by the very same scenario, albeit with different technologies, decades ago.'³

What has been learned from such 'rusting tractor' scenarios is that success is not derived from inserting advanced communication technology into a poverty-stricken social context, with attendant low levels of literacy and empowerment, and expecting positive transformation to come about naturally. John Daly's 2003 paper on ICT and hunger states the issue succinctly: 'In a fundamental way, ICTs are not going to help

² Information and Communication Technologies: A World Bank Group strategy, Washington DC: World Bank Group, 2002.

³ Beardon, Hannah. ICT for development: Empowerment or exploitation? Learning from the Reflect ICTs project. United Kingdom: Action Aid, 2005.



Market scene, Mali

these kids. They can't eat computers, telephones won't make them well. However, given people, policies and institutions working to solve the problems of hunger and malnutrition, ICT can make a difference.⁴

What kind of difference ICTs *can* make, particularly in the area of agricultural development and food security, was among the issues addressed during the World Summit on the Information Society (WSIS) Plan of Action.⁵ The plan argues that comprehensive country-wide information systems fulfil a clear need and are important. ICTs are at the basis of such systems. The importance of information access for agricultural development is the subject of paragraph 21 on 'e-agriculture'. The plan calls for measures to 'ensure the systematic dissemination of information using ICTs on agriculture, animal husbandry, fisheries, forestry and food, in order to provide ready access to comprehensive, up-to-date and detailed knowledge and information, particularly in rural areas.'⁶

In 2003 the Building Communication Opportunities Programme, a partnership of development organisations engaged in using ICTs for development, reviewed experiences of its members in supporting programmes designed to use ICTs for poverty reduction in sub-Saharan Africa. The study concluded that in many instances the programmes were successful in generating 'increased quantities of food crops, as well as additional amounts of cash in poor households [which] contribute to poverty reduction, to the availability of food and improve literacy and health.'⁷

With this booklet IICD wants to add its own experience to the growing body of literature demonstrating the role of ICT in attaining international development goals including the MDGs. This booklet explores the mechanics of this process in greater detail, looking specifically at IICD-supported projects, and at the use of ICT in the context of agriculture and rural livelihoods. It outlines areas and ways in which ICTs can contribute to improvement of livelihoods in the agricultural sector and provides lessons learned by IICD and its partners.

The booklet aims to set out the following:

- Chapter 2 describes the general mechanisms by which ICT can assist in achieving Goal 1 of the MDGs.
- Chapter 3 explores specific information and communication problems in the agriculture sector, and gives examples of IICD-supported projects that addressing these problems.
- Chapter 4 presents the monitoring and evaluation results from the same projects, looking at the actual impacts of the projects on poverty and an overview of lessons learned.
- Chapter 5 provides conclusions and recommendations related to the effectiveness of IICD and partner activities in addressing the MDGs.

⁴ Daly, John. Information and Communications Technology and the Eradication of Hunger. World Bank Development Gateway, 2003.

⁵ Document WSIS-03/GENEVA/DOC/5-E *Geneva Plan of Action*. ITU and Unesco, 2003.

⁶ ITU and Unesco, 2003.

⁷ Gerster, R. and Zimmerman, S. *Information and Communication Technologies (ICTs) and Poverty Reduction in Sub-Saharan Africa. A Learning Study (Synthesis)*. The Hague, IICD for the Building Digital Opportunities (BDO) Programme, 2003.

2. Linking ICT to poverty alleviation

In September 2000, the largest-ever gathering of Heads of State ushered in the new millennium by adopting the UN Millennium Declaration. The Declaration, endorsed by 189 countries, was then translated into a roadmap setting out global development goals to be reached by 2015.

Table 1 - Millennium Development Goals

Millennium Development Goals	
Goal 1	Eradicate extreme poverty and hunger
Goal 2	Achieve universal primary education
Goal 3	Promote gender equality and empower women
Goal 4	Reduce child mortality
Goal 5	Improve maternal health
Goal 6	Combat HIV/AIDS, malaria, and other diseases
Goal 7	Ensure environmental sustainability
Goal 8	Develop a global partnership for development

Information from: http://www.unmillenniumproject.org/reports/goals_targets.htm

The Millennium Development Goals have been widely accepted as a framework for setting priorities and measuring development progress in international development. The goals and targets have been harmonised, in many countries, with existing national poverty reduction strategies (PRSPs) and sector plans. In the agriculture sector, the existence of the MDGs and their measurable targets help to focus policymakers' attention on the interlinked priorities of food security, gender equality, rural poverty and environmental sustainability.

While ICTs receive an important mention in Target 18 of the MDGs (see annex 2), ICTs have a vital part to play in bringing about the realisation of Goal 1 – *to eradicate extreme poverty and hunger*, a goal which is associated with the specific target *to halve, between 1990 and 2015, the proportion of people whose income is less than one dollar a day*. In its Rural Poverty Report 2001, the United Nations' International Fund for Agricultural Development stated that '75% of the world's poor live in rural areas, most of which make their living in farming or farm labour. As this figure will drop only to 60% by 2020, a focus on rural poverty and agricultural development is crucial to the reduction of poverty overall.'⁸ In the long term, extreme poverty and hunger cannot be eradicated without an environmentally sustainable and efficient food production system that works for the poor, as well as income-generation opportunities for rural communities, enabling them to meet their basic needs including health and education for generations to come.

⁸ *Rural Poverty Report 2001: The Challenge of Ending Rural Poverty*. Rome: IFAD 2001.

Testing the satellite dish for the SEND foundation, Ghana



This report explores how ICT can be used effectively to strengthen the position of the poorest farmers in increasingly globalised agricultural markets, how it can bring new livelihood opportunities to rural communities, and how it can improve the efficiency and competitiveness of the agricultural sector as a whole in developing countries.

2.1 ICT in support of agriculture and rural development

Studies undertaken by the UK Department for International Development (DFID)⁹ and the World Bank¹⁰ provide a useful framework for clustering ICT interventions in the agricultural sector in terms of their relationship with different aspects of the problem of rural poverty: poor agricultural sector performance, low productivity and farm incomes, and the lack of political empowerment and social inclusion of rural communities.

The projects discussed here can also be grouped according to three areas of intervention:

- a. improving knowledge flows and policy environment in the agriculture sector
- b. increasing the economic viability of farm enterprises by increasing profitable market access and production efficiency
- c. increasing the political empowerment and social inclusion of rural communities.

Table 2 - MDG 1 'Poverty' and types of ICT interventions in the agricultural sector

Goal 1 'Poverty'	ICT interventions
a Conducive policy environment	ICT policy and strategy development in the agriculture sector Coordination and systematisation of agricultural information
b Increased profitability of small farms	Price information delivery systems
Increased market access	Marketing and selling online Facilitating contacts between producers and suppliers Circulating information about market conditions and export requirements
Increased production efficiency	Enhancing access to information and expertise about effective traditional and modern production methods Enhancing social status by use of ICT
c Political empowerment and social inclusion	Increasing negotiating power of farmers Access to information on land rights/cadastre Rural access to ICT

⁹ *The significance of information and communication for reducing poverty*. London: Department for International Development, 2002.

¹⁰ *ICT and MDGs: A World Bank Group perspective*. Washington DC: World Bank Group's Global ICT Department, 2003.

Case: Integrating traditional radio and innovative Internet connectivity solutions in Bolivia

Smallholder farmers in the remote valleys of Vallegrande produce 70% of the vegetables consumed in the city of Santa Cruz. In spite of this fact, they find themselves in a disadvantageous position when the time comes to take their products to the market.

To address the situation, the Instituto de Capacitación del Oriente (ICO) and the Central de Asociaciones de Pequeños Productores de Vallegrande (CAPA) started a project to gather and disseminate price information. Each morning at 6.00 am a market reporter goes to the market in Santa Cruz to collect prices, send them by e-mail to the rural information centre in Vallegrande 500 kilometers away, where they are broadcast twice a day via the radio programme Farmer's Mail, reaching 60,000 farmers. The information improves the farmers' negotiating position with the middlemen who collect and sell their produce.

To complement the radio programme, the project has set up five regional information centres equipped with computers and Internet access. To date, 630 members of producers' associations have been trained in the use of basic ICTs and information analysis, allowing them to make better decisions regarding where and when to buy inputs and sell their produce. Each centre maintains a database of volumes and market prices at the community level, allowing farmers to understand and compare price developments and production patterns in the region. The service provides farmers with information they need to make decisions critical to their livelihoods.

The centres are financially sustained by user fees for use of computers and the Internet. Internet access is provided through dial-up or shared satellite connectivity where available.

2.2 Options and target groups for ICT in agriculture

As its name implies, ICT serves two broad functions: it enables communication and serves to process and store information for future reference. In its 2002 ICT strategy paper¹¹ the World Bank Group defines Information and Communication Technologies as hardware, software, networks and media for collection, storage, processing, transmission and presentation of information in the formats of voice, data, text and

¹¹ *Information and Communication Technologies: A World Bank Group strategy*. Washington DC: World Bank Group, 2002.

Table 3 - Target groups in agriculture and ICT options to address needs

Examples of local target groups	Appropriate ICTs
Small-scale farmers	Face-to-face interaction
Farmers' associations and cooperatives	Drama
Middlemen	Illustrated printed materials
Municipal authorities	Text-based materials (books, reports)
Local extension agents	VHS and audio tapes, DVD/CD based multimedia materials including video
	Broadcast and Two-way radio
	Television
	Stand-alone or locally-networked computers
	Offline databases
	Mobile telephony
	Where connectivity permits:
	email
	chat
	Internet telephone (VOIP)
	shared web-based systems
Examples of national/international target groups	Appropriate ICTs
Ministries of Agriculture	Text-based materials (books, reports)
Research organisations	DVD/CD based multimedia materials
Commodity marketing boards	Intranet/Internet-based information
Chambers of commerce	Resources
Export promotion organisations	Networked computers Local area network (LAN)
National farmers' organisations	Fax
Supermarket chains	Email
Foreign buyers	Web-based dialogue tools and eDiscussion
Non-governmental organisations	groups
International agencies	Internet telephone (VOIP)
	Web-based shared systems

images. ICT sectors are a combination of manufacturing and services industries that capture, transmit and display data and information electronically.¹² Clearly, ICT encompasses a wide range of elements that include hardware and software, content generation, knowledge management as well as institutional and management processes. Appropriate use of ICT in agriculture requires the application of relevant combinations of traditional and modern ICT.

Agriculture in the 21st Century is one of the most diverse economic sectors, encompassing individual farmers, farmer organisations, government agencies, research institutes, traders, multinational corporations, NGOs and many others. A productive sector depends on a fruitful and fair interaction between the diverse actors – communication and information flows are critical to this process. However different approaches are needed when working with different target groups. The various groups have different information needs and modes of access. The technology and socio-economic context of the group determines the selection of ICT in terms of content, media and form of communication. The table below outlines, in general terms, the target groups operating at the different levels of the agricultural system and the most suitable technologies and approaches for information and communication.

The choice of ICT in each context depends on the available infrastructure and level of literacy and education prevailing in a specific situation. Connectivity in rural areas as well as in locations of other stakeholders can be achieved in various ways. Dialup lines, ADSL, use of mobiles, cable- or satellite connection. The latter often combined with MESH boxes to share bandwidth is applied increasing. With changing technologies, the optimal choice of ICT in a given situation changes. It is necessary to monitor technical options. It can be noted that with increasing connectivity the possibilities for two-way interaction between farmers themselves, and between farmers and other agencies, increases and with it the possibilities for local content production and validation. Also possibilities for making phone calls over the internet (Voice over IP - VOIP) increase with it.

¹¹ *Information and Communication Technologies: A World Bank Group strategy*. Washington DC: World Bank Group, 2002.

3. IICD project experiences with ICT in agriculture

In this chapter, we draw upon thirty-five IICD-supported projects involving the use of ICT in agriculture in nine countries. The projects reviewed in this booklet can be grouped according to the criteria set out in paragraph 2.1 which address the poverty addressing the poverty issues in MDG1.

Hereafter the link between the IICD supported activities and Goal 1 of the MDGs is explored. Each of the five components is illustrated by examples of projects (see table 4). A brief description of all IICD supported projects in the agriculture sector can be found in annex 3.

Table 4 - Overview of IICD projects as per Millennium Development Goal 1

Goal 1 'Poverty'	ICT interventions	Projects		
1 Conducive policy environment	<ul style="list-style-type: none"> • ICT policy and strategy development in the agriculture sector • Coordination and systematisation of agricultural information 	1 ICT strategy for the agricultural sector - MAGDER - Bolivia		
		2 Ghana agricultural information network system - CSIR - INSTI - Ghana		
		3 Agricultural business information system - RADA - Jamaica		
		4 Development of an effective information flow system - ZARI - Zambia		
		5 Farmers' Information Centres in Mansa and Kasama Districts - Ministry of Agriculture - Zambia		
2a Increased profitability of small farms	<ul style="list-style-type: none"> • Price information delivery systems 	6 Agriculture information and monitoring systems in the valleys of Santa Cruz - ICO - Bolivia		
		7 Chuquisaca marketing information system - ACLO - Bolivia		
		8 Information System for Innovation and Competitiveness of Small Farmers - CEPAC - Bolivia		
		9 Market price information system using web and national television in Burkina - IABER - Burkina Faso		
		10 E-Commerce for Non-Traditional Exports - Ministry of Food and Agriculture - Ghana		
		11 Market access support for agricultural partners - Technoserve - Ghana		
		12 Agricultural price and business information services - CROMABU - Tanzania		
		2b Increased market access	<ul style="list-style-type: none"> • Marketing and selling online • Facilitating contacts between producers and suppliers • Circulating information about market conditions and export requirements 	13 Commercial information and advisory system for agriculture producers - CEPROBOL - Bolivia
				14 Technical-commercial information centres for the agro-ecological sector - AOPEB - Bolivia
				15 Business Intelligence Trade Points - FIAB - Burkina Faso
				16 Improvement of internal communications in the shea butter sector - Sontaaba - Yalgré - Burkina Faso
				17 ICT for cacao producers - MCCH - Ecuador



Documenting the AGRECOL project, Chapare, Bolivia

Goal 1 'Poverty'	ICT interventions	Projects
		18 Strengthening the information and training network for producers working with the Camari-FEPP fair trade system - Camari/FEPP - Ecuador
		19 Eastern corridor agro-market information centre - SEND - Ghana
		20 Market access promotion network - MAPRONET - Ghana
		21 Use of ICT in shea butter marketing in Mali - ULPK - Mali
		22 Agricultural business information services - BIS - Tanzania
		23 Rural information system to support a commodity exchange - UCE - Uganda
2c Increased production efficiency	<ul style="list-style-type: none"> Enhancing access to information and expertise about effective traditional and modern production methods 	24 GIS system for certification of cacao producers - CEIBO, CEPROEST - Bolivia 25 ICT for the exchange of farmer experiences in ecological agriculture - Agrecol Andes - Bolivia 26 Improvement of agriculture-related information channels to farmers in the rural area of Sissili - FEPPASI - Burkina Faso 27 Communication to manage sustainable production systems - CEA - Ecuador 28 Central and satellite agricultural information centre - St. Elizabeth and Manchester VGA - Jamaica 29 Agriculture research and rural information network - Ndere Troupe - Uganda 30 ICT support for exporting organic products - OPPAZ - Zambia
3 Political empowerment and social inclusion	<ul style="list-style-type: none"> Enhancing social status by use of ICT Increasing negotiating power of farmers Access to information on land/rights/cadastre Rural access to ICT 	31 ICT for agriculture in the Chiquitano region - APCOB - Bolivia 32 Information on Conflicts and Negotiations in Communitarian Original Indigenous Lands - CIDOB - Bolivia 33 Information system on public investments for small producers in agriculture - CIOEC - Bolivia 34 Impacts of free trade on agriculture - Acción Ecológica - Ecuador 35 ICT policy process in agriculture - MOFA - Ghana

Case: ICT policy and strategy for the agriculture sector in Bolivia

Recognising that a concerted effort was needed to link up ICT projects undertaken by civil society and the private sector to government policies at sector level, Bolivia's Ministry of Agriculture agreed to play a coordinating role in the sector with regard to information exchange. In 2002, the Ministry of Agriculture began developing and implementing an ICT strategy for the agriculture sector. Representatives of various stakeholder groups including grassroots organisations, NGOs and government institutions all participate policy process, with IICD providing a facilitation and advisory role.

A comprehensive ICT policy and strategy for the agriculture sector was finalised in 2003. In 2004 implementation began with a first step of strengthening the internal ICT capacities of the Ministry. This included ICT infrastructure and awareness raising and training for the Ministry's staff. All higher and lower staff were equipped and trained in technical skills and information management, resulting in an information culture in the Ministry placing ICT and information as both a strategic component of the agriculture policy and forming part of daily working practice. In 2005 efforts were extended to the regional branches of the Ministry, enabling them to set up regional knowledge exchange networks responsible for coordinating information exchange between producer organisations, NGOs and the private sector at the regional level. The networks will be governed by a coordination committee, with participation from all stakeholder groups.

In order to support information exchange between national and regional levels, the adopted ICT solutions focus on networked computer systems at the Ministry and its regional departments and a structure of linked web portals at national and regional levels. This approach promises to bring long-term benefits to the agricultural sector as a whole, which in turn should have a positive impact on Bolivia's national economy. It also inspires Ministries in other sectors to adopt similar approaches in order to improve the flow of information to and from citizens (www.agrobolivia.gov.bo).

3.1 Creating a conducive policy environment

Development and sustainable growth of the agriculture sector depends on a favorable policy environment, including a favorable investment climate, transport and communications infrastructure, and research and development in the service of innovation in the sector. ICT investments in support of agricultural development must include reliable and affordable country-wide infrastructure (essential for all public services as well as the economic health of the country), as well as measures that target agriculture and rural communities.

While national ICT policies address broad areas of telecommunication policy and infrastructure, it is important that policymakers reflect on how ICT can best be utilised to achieve MDG targets – leading to national or sector ‘ICT for Development’ (ICT4D) policies rather than simply ICT policies. In an ideal situation, ICT is recognised as a tool for rural development by key ministries responsible for rural development and telecommunication. This will lead to the introduction of policies to support the use of ICTs for sharing knowledge, enhancing rural access, and building capacity for information management among government agencies responsible for agriculture.

IICD and its partners in the various countries work to foster a multi-stakeholder process involving civil society, private sector and government, to formulate ICT4D policies and strategies. IICD supports or has supported national ICT policy processes in Bolivia, Ghana, Jamaica and Uganda, and policy processes in the agriculture sector in Bolivia and Ghana.

3.2 Agricultural information systems

National agricultural information systems are an important part of a conducive environment for agricultural development. Making relevant research and extension information accessible for the whole sector including local users is a task that can be catalysed at the national level and supported with ICT.

‘Fertile Ground’¹³, a review undertaken in 2003 of global and national agricultural information systems carried out by IICD with support from DFID, indicates the need for coordination and streamlining existing agriculture information sources, both internationally and within developing countries. The authors point to a discord between the information needs of farmers and the information provided by international agencies, which is insufficiently localised and overly scientific in its

¹³ Besemer, H., Addison, C., Ferguson, J. *Fertile Ground: Opportunities for greater coherence in agricultural information systems. The Hague: IICD, 2003.*

presentation. Generating local information and customising content is an area where national systems can play a role. There is also a need for increased interoperability between information systems at local, national and international levels. Furthermore, collaboration with civil society and the private sector can ensure that producers are reached effectively and costs reduced.

Within national systems, information on technologies and good practices from research institutes, practitioners and expert networks is often available only in hardcopy form or in stand-alone computer databases. In many cases, data are incomplete or not compatible with other sources. Local knowledge and good practices are in general not at all available. By harmonising existing information sources and making information accessible in appropriate formats, important gains can be made.

Information is expensive to generate and keep up-to-date. Developing a proper information system is a costly affair and requires skilled human resources. Economies of scale can be realised through collaboration and use of shared platforms and common standards by information providers. The re-use of information and the implementation of common technical standards and classification systems will increasingly take place. It is important to develop multi-stakeholder mechanisms at the national level that address this issue and thereby assure that information becomes more easily accessible for end-users.

IICD currently supports several initiatives to make agricultural information more easily accessible in a systematised manner using ICT. One such initiative is the Ghana Agriculture Information Network System (GAINS), which endeavours to link the libraries of agricultural research institutions under the Council for Scientific and Industrial Research, the faculties of agricultural libraries of the universities, the library of the Biotechnology and Nuclear Agricultural Research Institute and the Ministry of Food and Agriculture.

In Zambia, the Zambian Agricultural Research Institute (ZARI), part of the Ministry of Agriculture, started the project ‘Development of an Effective Information Flow System,’ which aims to make research results correspond to particular production problems of farmer groups in Zambia. In order to adapt complex research results into clear messages that address farmers’ needs, the information department of the Ministry of Agriculture initiated a complementary programme to create materials using a combination of text and visual media in English and local languages.

In Jamaica, the Agricultural Business Information System and the Jamaica Export Initiative was set up by the Ministry of Agriculture and the Export Promotion office.



Tending to crops, Seguedin, Burkina Faso

In this programme, information on prices, availability, etc. is gathered at the farm level through hand-held computer devices, and the information is centralised in a national database. The information is then made available through a web portal and compiled into printed reports customised for each target group.

3.3 Price information systems

Farmers in isolated rural areas are often unaware of the value of their crops in main markets. They find themselves in a poor negotiating position vis-à-vis middlemen, who routinely under-represent the final selling price and overstate transaction costs. The same holds for the price of seeds, fertiliser and other inputs, with farmers paying an inflated price for inputs. Farmers may also be unaware of strategic opportunities within their own region – which crops and commodities are fetching higher prices in surrounding towns and which products are in high demand. Getting accurate and up-to-date price information to farmers, therefore, can have a dramatic impact on their negotiating position in the agricultural economy and on their cash income. In this process ICT, traditional and modern, can play a critical role.

A common approach undertaken by NGOs and governments is to set up a price information system. Typically, prices are collected in the main regional markets and stored in a central database at the regional or national level. The information is then published on a website, accessible at local level through small information centres equipped with computers and Internet. To reach a much wider audience, market prices can be broadcast to isolated communities via two-way radio or rural radio, thereby creating a 'level playing field' between all the producers within a given region as well as the middlemen operating in the same zone. Numerous projects operating on this model have been supported by IICD, with differences of scale, media employed, and different types of partners.

The E-Commerce Project operated by the Ministry of Agriculture in Ghana collects prices in key markets around the country, organises the information in a central database and publishes it on the Ministry website (www.mofa.gov.gh). Farmers can access the information via the provincial offices of the Ministry.

In the same way, the CROMABU project in the Great Lakes district of Tanzania supplies information to farmers on input supplies and prices of cash crops such as cotton, maize and rice, as well as more general information on transport. The information is disseminated via information centres as well as other media (see case).

Case: Challenge of telecentre sustainability in Tanzania

Although there is no competition from other telecentres in the area, the CROMABU information centre in Magu is seeing its client base eroded by the spread of mobile phones - a direct result of liberalisation of the Tanzanian telecoms sector. More people at the community level are now using mobile phones to access information and for communication. This is viewed as a challenge for the centre as it is cheaper to access a mobile phone than to visit an information centre to access the web. In most cases, people who access information from the Internet in rural areas are the same as those who use mobile phones. Recently, several local NGOs and the District Commissioner, who is doing his postgraduate studies online, have approached the centre. They are interested in sharing the centre's existing Internet connection. 'This is seen as an opportunity for the project's sustainability. Cost sharing minimises the operational costs of the project and allows us to keep the farmers informed about prices,' says Naomi Maselle, who manages the centre in Magu.

Burkina Faso provides an interesting experience of the integration of traditional and modern ICT in providing price information with national coverage. The agricultural institute IABER collects price information in the principal livestock and commodity markets of the country and stores this in a central database. The prices are disseminated through national television. Although by no means does every family have a television in Burkina Faso, nevertheless the high-profile program serves as a powerful vector to disseminate accurate prices via word of mouth to the farthest corners of the country.

Several examples of IICD-supported price information systems are found in Bolivia. Three NGOs Fundación Acción Cultural Loyola (ACLO), Instituto de Capacitación del Oriente (ICO) (see page 17) and Centro de Promoción Agropecuarios Campesino (CEPAC), operate price information systems in three regions in Bolivia. They collect information in the main regional markets on a daily basis. The price information is sent via Internet to a network of rural information centres operated by local farmers' associations. All three Bolivian projects use radio to inform a wide audience about prices in local languages. Radio ACLO reaches over half a million Quechua-speaking people in the Andean highlands. In the programme Farmer's Mail, the NGO ICO makes price information available to 60,000 farmers in the region of Vallegrande. Another radio programme broadcast by CEPAC is reaching a similar number of farmers in the Ichilo region in the west of Bolivia. In all three regions, the radio programmes have a daily audience of over 75% of the farmers in the region.

Case: Integrating Internet and radio in Bolivia

The project of the Centro de Promoción Agropecuaria Campesina (CEPAC) assists producers' associations to improve production methods and marketing of their products through five information centres in the region of Ichilo in Santa Cruz. The centres are jointly operated by local governments and producer associations. The service provided by the centres is complemented by a very successful radio programme Let's Go to Market.

María Rita Salvatié describes the process of producing the radio programme: 'Every day we prepare the radio programme. We broadcast it twice, at 7am and at 7pm. This programme provides information concerning the prices in the markets reaching 10,000 farmers in the region. It also offers information and advice to producers concerning crops and other news like the weather forecast, the exchange rate of the American dollar, and information provided by the team of agricultural technicians. We have carried out workshops to teach our people to interpret the prices.'

3.4 ICT and increased market access

Another way in which ICT can improve livelihoods of farmers is increasing their access to potential markets. Several IICD-supported projects are working in this area and use ICT to facilitate contact between sellers and buyers, promote agricultural exports, facilitate online trading, and make producers aware of potential market opportunities including consumer and price trends in northern markets.

By increasing awareness among producers on consumer trends and new production techniques, ICT can contribute to the diversification of production. Potential areas are production of high value crops such as organic fruits and vegetables and niche commodities such as medicinal plants. ICT-based information systems help intermediary organisations working with farmers to monitor the quality of production and applying standards to comply with regulations of major importers including the European Union.

Among the IICD-supported projects that focus on market access is the Commodity Exchange Project in Uganda. The project combines a warehouse facility with an ICT-enabled crop marketing bureau which focuses on improving access to available commodities for buyers, and on providing technical information to farmers to assist them in meeting quality standards.

Case: Combined warehouse and ICT-assisted commodity trading in Uganda

A truck loaded with three tons of coffee rocks towards a big and empty warehouse in Kabwohe, in Sheema district in southwest Uganda. It is the first delivery coming from three farmer societies. Instead of selling their coffee by means of the middleman, the goods stay here until the farmers agree on a price with the highest bidder on the trading floor of the Ugandan Commodity Exchange (UCE) in Kampala. Essential to this system is timely and accurate information on the market and the current prices.

That is where ICT comes in and provides a two way information stream, commodity information to the market and price information to the farmer groups. This system is built under the Rural Information System project of UCE, supported by IICD. It collaborates with an EU project which focuses on warehousing facilities for commodities. The project has been received very well; three centres have so far been opened in Uganda. The National Agricultural Advisory Services (NAADS), key implementer of a programme for modernisation of agriculture in Uganda, and UCE are now collaborating to replicate the project in twelve districts. Even though the project is still in its early stages, the economic impact of the project is already promising. At this stage the project reaches three centres with twenty-four farmer groups, each group with over 200 farmers, for a total of approximately 4,800 farmers. 'With better prices, our standard of living will improve and we shall even improve further the quality of our coffee. Later we hope to sell beans, peas and honey in this way. Everybody will benefit', says a farmer and secretary manager in Kabwohe.

In Bolivia, the Association of Ecological Farmers (AOPEB) supports agricultural production and sales in its project 'Technical-Commercial Information Centres for the Agro-Ecological Sector'. Information is provided to buyers on the volume of sales and quality of products offered, especially organic cocoa, coffee, nuts, tropical fruits and quinoa. A website offers information to farmers on market opportunities, certification norms, price trends and production technology. The information is made available through fourteen regional information centres, reaching over 30,000 farm families throughout Bolivia via the Association's 51 member organisations (www.aopeb.org.bo).

The ECAMIC Project in Ghana enhances the production and marketing of soybeans (see case below). A similar project in Ecuador, 'ICT for Cacao Producers', brings small-scale cacao producers into a more direct relationship with their markets. In Tanzania and Burkina Faso, the Agricultural Price and Business Information Services Project and the

Business Intelligence Trade Points Project assist small producers by providing information on national market opportunities.

The export promotion centre of Bolivia (CEPROBOL) has taken a step further in offering an e-commerce platform to small export companies. CEBROPOL provides information on export opportunities and requirements for agriculture products, including an e-commerce platform where producers can offer their products for sale via the Internet (www.ceprobol.gov.bo).

Case: Increased profits for soybean farmers in Ghana

The Social Enterprise Foundation of West Africa (SEND) promotes the cultivation of soybeans in the northeast of Ghana. The potential market for soybeans and their high nutritional value offer potential to enhance income of farmers as well as improve food security. Initially SEND provided extension services and built the capacity of farmers to produce and consume soy. However it remained difficult to find buyers for the soybeans. At the same time, soy oil processors were having trouble finding sufficient volumes of good quality soybeans for their plants.

By selling cooperatively, individual farmers have become reliable suppliers to oil-processing companies. To bring together the market actors the project established two offices in remote villages of Salaga and Kpandai. In one location Internet connectivity via a VSAT is used, allowing for the exchange of commodity supply information by email or Skype. The other office communicates via mobile telephones. At the central SEND office, information is entered into a database to analyse the data and communicate with the buyers on quantities available, quality levels, and locations. Thereafter deals are negotiated.

The farmers profit from an enlarged market and up-to-date information on market prices. Large scale buyers benefit from the efficient organisation of supply and transport. Bosbel, a large oil producer, states that the project has 'been very beneficial for both sides'. Whereas the project started only recently it already reaches over 10,000 people in 41 communities. According to one estimate farmers' net income has increased by 20%.

3.5 Increasing production efficiency

Increasing the efficiency and productivity of small-scale farms is another area where ICT can make a significant contribution. Farming is an uncertain business, with farmers facing many threats to their harvest from poor soils, drought, erosion and pests. National extension systems that used to provide information and advice to farmers have been drastically reduced. Climate change is adding another level of instability to the lives of farmers; increasing weather instability and increasing temperatures require adapting techniques to the changing ecological conditions. In this environment, ICT can greatly facilitate the flow of information about production techniques to farmers and also open up new opportunities for farmers to document and share experiences with each other. Traditionally the information flow has been one-way. Systems and approaches have been put into place that allow input by local communities and dialogue between peers to be transmitted via two-way communication systems. IICD supports initiatives to collect and share knowledge and processes for interaction between farmer groups and experts. Packaging information in a way that is relevant locally is a key issue in these projects.

Case: Multimedia to document traditional Andean farming practices

Farmer-to-farmer exchanges, in which farmer groups visit other groups to exchange experiences in traditional production methods, are a longstanding tradition in Latin America. Yet these exchanges can be time consuming and costly, and are difficult to replicate. Agrecol Andes introduced local communities to the use of presentation software, using pictures, graphs and text and oral testimonies to document traditional sustainable production techniques. A representative of the farmers' group exchanges the documented experience with other producer groups in different parts of Bolivia, each time enriched by new insights. 210 farmers have participated in the project to date. The choice of technology is compatible with the predominantly oral culture of Andean communities (www.agrecol.org.bo).

'Farmers in the Quechua indigenous organisation of Sacaca, participated in the first meeting to acquaint themselves with the project. They documented their vegetable production methods and shared this information with other communities using ICTs. After some months, Sacaca gathered funds from each peasant to buy a digital camera. Thereafter they travelled nine hours to the project office to request a contribution to purchase a computer. Now the community documents experiences for training of the community. They negotiate projects and make demands to the local authorities. Pictures are used to justify their demands for construction of bridges, improvement of local roads, etc.' Orlando Arratia, Agrecol Andes, Bolivia.

Flyers and posters are still commonly used to deliver information such as pest warnings to farming communities. However ICT allows for a two-way flow of information. Equipment is becoming cheaper and easier to use, and IICD has found that with proper training, complex technologies such as video are emerging as realistic options for organisations including rural NGOs and farmers' organisations.

Agrecol, a Bolivian NGO, is enabling farmer-to-farmer exchanges on production techniques using presentation software and digital photos. A similar initiative in Ecuador is using multimedia to document sustainable production methods for coastal areas and to lobby for the protection of the mangrove ecosystems, which are under threat from commercial shrimp farms. In Uganda, a combination of media for dissemination of information is used.

Case: Combining theatre and Internet in Uganda

Ndere Troupe in Uganda is a drama and theatre organisation that disseminates information on more efficient and effective production methods through a network of hundreds of rural based drama and community groups across Uganda. It has started capturing the performances on video and distributing the material on CD to small rural information centres to reach a wider audience. The centres are equipped with basic computer facilities and Internet access. In the centres, community based organisations use the materials to develop their own theatre performances or to use in training.

In Jamaica and Ecuador, IICD supports partners that assist farmers in optimising use of inputs and controlling plant diseases. Both operate of these projects make information available through rural information centres. At the centres, farmers are provided with printed materials and trained to use the Internet to search for information on production methods.

An innovative use of ICT is found in projects run by farmer associations in Bolivia (El CEIBO) and Zambia (OPPAZ). These projects are in search of methods to support the certification of organic products. Certification requires a detailed and intensive monitoring of production methods and land use, which is currently done by costly and time-consuming manual measurements. This often leads to insufficient, late or no measurement at all, resulting in farmers losing their organic certification and thereby foregoing opportunities to increase their income. The Bolivian and Zambian projects use Global Positioning Systems to gather the required measurements, and send the information to the certification authorities by email.

3.6 ICT and empowerment

IICD has found a close relationship between use of ICT and empowerment. When individuals acquire ICT skills and the ability to access information, they often find their social status as well as employment opportunities increase.

Small farming communities can also become more empowered through better access to market prices, available credit and subsidies, market opportunities, and also by increasing their contacts with a range of traders and buyers.

ICT can help community and farmer organisations to strengthen their institutional capacity and better represent their constituencies when negotiating land claims, resource rights and infrastructure projects. This can be done for example by ensuring access to information on legislation, and enabling use of the Global Positioning System (GPS), digital cameras and Internet to document and communicate their situation.

Providing means of communication and access to relevant information allows local communities to interact with other communities and institutions at regional and

Case: Enabling farmers to bid on public tenders in Bolivia

The milk producers' association in Challapata, a village in the highlands of Bolivia, had difficulties in finding sufficient market outlets. Its sales were limited to the village and its surroundings. It was aware that the government was seeking suppliers to provide milk for a national school breakfast programme, but it was always informed too late or never about relevant tenders. Furthermore the association did not have sufficient experience to understand the tender documents.

The national coordinating organisation of small producer associations CIOEC used ICT to give the milk association and other affiliated associations a chance to participate in public tenders for supply of agricultural products. The rural associations were equipped with a computer, linked to the Internet and trained in basic computer skills. When a tender opportunity is spotted, the associations receive the tender documents and are assisted with the bidding process via an email-based advisory service. The project has until now strengthened sixteen information centres throughout Bolivia, reaching a total 400 representatives of 55 farmer organisations. As a result, several organisations have effectively participated and won tenders for the delivery of various products to smaller municipal governments, particularly those where large-scale vendors have less interest.

national level. This strengthens social inclusion of disadvantaged groups and rural communities. It is realised through various means such as rural information centres, radio and mobile phones and more recently VOIP. It widens the perspective of local communities on national or global developments and allows easier contact with friends and relatives thereby reducing social isolation.

In IICD-supported projects, empowerment and social inclusion starts at the moment of project formulation. It is an interactive and participatory process in which the target groups define priorities and actively carry forward the process of formulation and implementation. It contributes to empowerment and the sense of ownership.

The project 'Information System on Public Investment for Small Producers' run by CIOEC in Bolivia is an example which seeks empowerment and social inclusion. The project aims to involve rural farmers' groups in bidding on public tenders, for example on opportunities to supply milk or quinoa to schools. CIOEC guides farmers in the submission process and supports their participation in the process.

APCOB works with indigenous groups in the Chiquitano region of eastern Bolivia to promote their cultural traditions and document traditional production methods. It has equipped remote communities with two-way radio linked to information centres in regional towns. Stories are collected by trained reporters and sent to the information centres, where they are disseminated through radio programmes. The programmes also inform the communities about potential market opportunities for their products. The centres are equipped with Internet to link potential buyers outside the region. The project has successfully found buyers for locally-produced honey.

Case: ICTs support indigenous people in reclaiming their land in Bolivia

Bolivia's indigenous groups struggle to reclaim their land, which they consider a vital element for survival and social development. Since the nineties, they have demanded the transfer of ownership of 29 million hectares of Original Community Lands (OCLs). In spite of promises made by various presidents and the enactment of the Law of the Lands in 1996 to facilitate the transfer of OCLs, the legalisation process is slow. To address this challenge, the Confederation of Indigenous People of Bolivia (CIDOB) developed the project 'Conflicts and negotiations on indigenous lands' to empower the indigenous groups and the broader community on the legalisation process.

CIDOB has taken up the challenge of using traditional and virtual means of communication to speed up the process. An information network is set up between 8 regional indigenous organisations that - next to informing the indigenous communities - ensure national and international publicity for the claims of the indigenous communities. Eliana Rioja, the project's manager: 'Indigenous organisations as the claimants of the OCLs, international development institutions, human rights and civil institutions, and the national and international media all have an important role in the implementation of this process. They exert the necessary political and social pressure.'

In September 2001, the Internet was used to spread the news on a land conflict near Santa Cruz, where livestock companies collided with an Indigenous Assembly and kidnapped its leaders. News reports on CIDOB's web page are one way of scrutinising the legalisation process. Indigenous leader Dona Julia tells: 'The project is acting as an information facilitator, exchanging information with the other actors and guiding them so that they actually become aware that our demands are legitimate.' CIDOB has an agreement with the government to constantly monitor and streamline the advancement of the process by gathering and making available up-to-date information on the transfer of OCLs. Complementary to the information centres, CIDOB's website provides access to a detailed database with an overview of land claims, progress in the legalisation process, geographical dimensions and various satellite maps of OCLs, which are constantly being revised and updated. In addition, natural resources, management areas, relevant agreements, socio-economic data, the level of government participation in oil companies on indigenous territories are other subjects of the website (www.cidob-bo.org).

The process of gathering reliable information is carried out by the project team in close cooperation with the regional indigenous groups, who have been trained for this purpose. 'The website allows indigenous people to interact with the whole world and gives them a platform for their territorial demands, backed up by a base of actual reliable data,' explains a Project team member, the engineer Alain Patiño Cruz. As part of the Project, a Capacity Development Centre is in charge of training the indigenous leaders in using computer programmes, email and the Internet. Almost 1,000 indigenous leaders have obtained qualifications in this area since June 2001.



Local women making furniture, Magu, Tanzania

4. Impact of ICT on poverty alleviation

Development is a complex process, and it is difficult to measure the impact of ICT on poverty alleviation, isolating its effect from other influences even within the setting of a project. Nevertheless, it is important to have mechanisms in place for monitoring and evaluation (M&E) that enable donors as well as those involved in the project to assess over time the effects of ICT interventions on poverty reduction.

IICD monitoring and evaluation methodology

IICD monitors and evaluates its programmes using quantitative and qualitative data. The two main instruments are questionnaires which are administered in an online evaluation tool (<http://demosurvey.iicd.org>) and focus group meetings. Data analysis based on the questionnaires provides valuable information on who the users are, on their level of satisfaction with the services, and on their perceived impact. Users are requested to rate several statements like: 'Through this project I now see more opportunities for Information and Communication Technologies for my sector' or 'Through this project I have access to price information to sell my produce.'

Most of the projects in this study participated in one evaluation in 2005, with four projects participating over a period of three years. The evaluation process will continue, which will allow for a more in-depth analysis of the results and the linkages with poverty alleviation in the future. To put the data analysis in a qualitative perspective and to start learning from the results, focus group meetings are organised in which project partners and users discuss the possible explanations for the results and share knowledge on possible solutions to the issues raised. This component provides IICD, project partners and users with an instrument for learning and adjustment of their projects.

As with any evaluation methodology, IICD's system presents challenges. Extrapolation of results of the evaluated user group (the survey sample) to a wider group may have its flaws. 'Impact' is already measured after one or two years of implementation, which is unusual in the field of Monitoring and Evaluation in development programmes. IICD is using this methodology specifically to monitor progress and impact over time, and to allow adaptations to be made as early as possible in the programme. As soon as the target groups of the projects are reached, they are able to air their opinions and indicate their perceived impact. However, sustainable long-term impact may take longer to occur in the programmes. That is why IICD monitors effects with the same user groups over a number of years. The number of questionnaires has increased over the years and provides a more solid basis for analysis.

One of the guiding principles of IICD is local ownership, a principle which forms the basis of its evaluation methodology. M&E is treated as a tool for learning rather than control, and is carried out by a local organisation in each country. Main aspects of the approach are two fold: gathering data regarding the profile of end-users of the projects (age, income etc.), and using questionnaires and focus groups to gain an insight from the participants themselves of how the project has affected them. Participants and end-users can include farmers, researchers and government officials.

The level of satisfaction of the participants with different aspects of the project is the main indicator to monitor the effects of the projects. By regularly feeding data back to the project teams projects are able to adjust during implementation, rather than learning afterwards as is the case with a traditional post-project evaluation. Evaluation data has been collected in this manner since 2003, and, for several years, will continue to provide information on changes over time.

It has been observed that projects that target farmers directly tend to register a direct impact on poverty alleviation. Other projects focussing on intermediary organisations in which researchers and government officials form the main target group will have an indirect impact; the benefit of these projects is their contribution to a more conducive environment for poverty alleviation.

4.1 Profiles of project users

The main groups of users of the projects in this study are farmers with small and medium-sized farms, researchers and government officials. Within these groups a distinction is made between direct users and indirect users. Direct users are people trained in the use of ICT and who directly contribute to or use the ICTs and related agriculture information services provided by the project. Within the thirty-five projects in this study there are 20,000 direct users, an average of over 800 per project.

Indirect users are those who receive information from the projects, via information brochures, websites and radio and TV programmes. Though the indirect users are not registered, a relation of one to ten direct and indirect users was found. Therefore an estimated 200,000 indirect users are benefiting from the projects. They are served through 200 information centres in the nine IICD focus countries.

Since 2003, a total of 1,000 questionnaires have been collected for a subset of fifteen projects in seven countries. The other projects have started more recently and data collection has only just started. The number of questionnaires is statistically representative for the group of around 12,000 direct users of the projects evaluated.

The user profile is characterised by data on rural/urban spread, education levels, income levels, age and gender. The combination of these indicators assists in analysing the users reached and their socio-economic position.

Most project users (95%) live in a rural area or district town and 70% of the project users have reached primary or secondary education. Some 96% of the project users consider their household income to be average or below average, with 54% of the users considering it to be below average. The combined figures indicate that the majority of users are located in rural areas and belong to the poorer sections of society, in line with the projects' key objective of poverty alleviation. The profile of users has shifted since 2003 towards increased participation of lower-income users in rural areas as a result of an explicit strategy of IICD and its Northern and Southern partner organisations to work more with grassroots organisations and to increase the number of projects focusing on communication and information access in rural areas.

Table 5 - Monitoring & Evaluation data

Geographic area	Rural	76%
	District town	18%
	Urban centre	6%
Education	Primary	30%
	Secondary	39%
	Tertiary	31%
Age	Below 21	10%
	Between 21 and 40	66%
	Above 40	24%
Gender	Female	30%
	Male	70%
Income level	Below average	54%
	Average	40%
	Above average	6%

Data from 15 IICD-supported projects in the agriculture sector.

Analysis of the age groups reveals that many project users are between 21 and 40 years old. This is not surprising, since agriculture projects target the active workforce in a country. The figures also indicate that 30% of the users are female while 70% are male. This is an issue of concern given that the majority of the world's poor are women¹⁴ and that women play a central role in agriculture. Illiteracy and heavy workloads are among

¹⁴ United Nations Department of Public Information, 2003. Empowering Women: *The Key to Achieving the Millennium Development Goals*.

the factors that inhibit women from participating. Cultural attitudes also prevent women from attending meetings or visiting rural access points. Chapter 5 provides some lessons learned and suggestions to address this issue on a structural level.

4.2 Impact on poverty alleviation

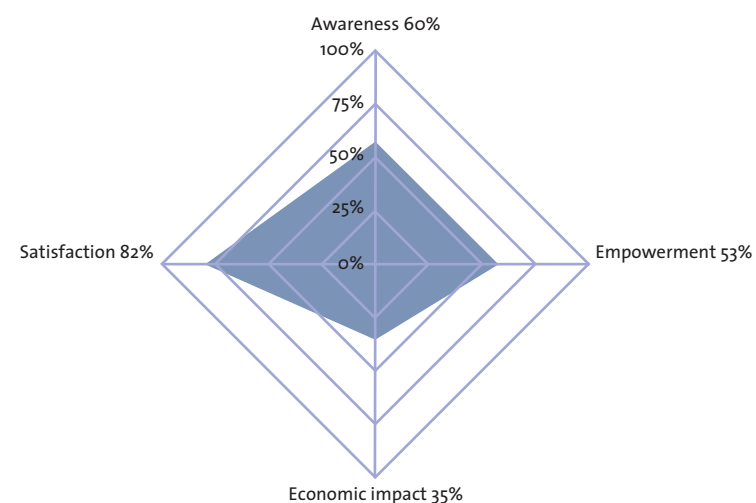
In order to measure the impact of ICT projects on poverty alleviation, the M&E methodology provides insights in the following aspects:

- Satisfaction with the ICT and information services provided through the projects
- Awareness among users on the potential use of ICTs
- Empowerment of the users in terms of increase in skills, social status, self-confidence and influence on decision-making
- Economic impact in terms of increased income levels of users and more specifically on access to price information, access to local markets, increased negotiation position and access to information on production methodologies.

The first indicators of success of projects are the level of satisfaction (82%) and awareness (60%) with the ICTs and related information services provided by the projects.

Respondents overwhelmingly consider that they have achieved their personal goals via the project in the first years. To a large extent this is explained by the emphasis on awareness-raising and skills development in IICD projects. Most users were satisfied with

Figure 1 - Impact of 15 IICD supported agriculture projects

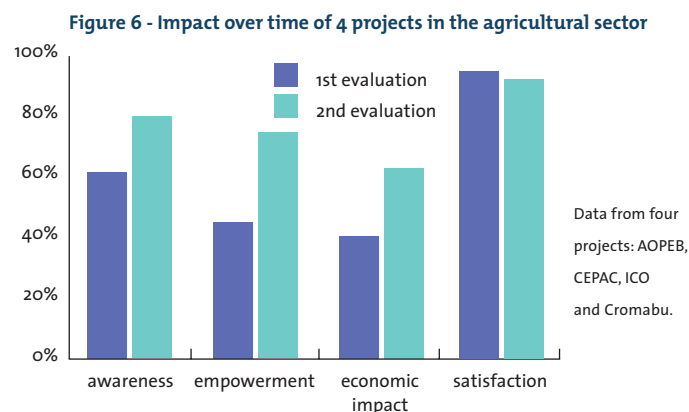


the services provided by the project, including training, technical support, the quality of the information and the service, and even the cost of the service.

Satisfaction and awareness about use of ICT and the information services are expected to be high during the start-up phase, when many users are exposed to ICTs for the first time. This period generates high expectations for the new technologies. After two years of implementation, the project users may become impatient when the information services do not function optimally. Many services require time to establish reliable connectivity, functioning hardware and relevant content, and may not have overcome all start-up problems. Measurements after one year show that levels of satisfaction have gone down by 2%. Yet, contrary to what is expected, awareness levels continue to rise in the course of implementation by around 20%.

IICD-supported projects in agricultural livelihoods have as a primary objective to contribute to poverty alleviation. The main relevant indicators are empowerment and economic impact. More than half of the users indicate that they feel empowered by participation in the projects. The economic impact of 35% in the first year of implementation is lower than expected. An explanation is that due to realities on the ground, it takes time before the developed capacities can take effect and result in actual economic benefits for the users of the projects.

Data from four projects collected over several years indicates that after two years of implementation, the levels of empowerment and economic impact do indeed increase by an average of 20%, which contributes directly to poverty alleviation. This is encouraging, since IICD invests a great deal in awareness-raising and capacity development of project staff and users.



The relationship between improving agriculture and poverty reduction is confirmed by the 2003 Learning Study carried out by the Building Digital Opportunities (BDO) Programme. The study looked at three projects and found ‘Increased quantities of food crops, as well as additional amounts of cash in poor households [which] contribute to poverty reduction, to the availability of food and improve literacy and health’¹⁵.

Analysis of the M&E results shows that projects aimed at creating a conducive environment for agriculture, contribute in a more indirect way to poverty alleviation. Users are primarily higher income groups including researchers and government officials. Projects focusing on increased profitability and market access have a stronger and more direct impact on poverty alleviation, as they work directly with lower income groups. This is achieved through improving the negotiation position in the marketplace, enabling users to demand and receive better prices for their products. In addition, users value improved access to price information, which is considered to have a direct effect on their income (see figure 2).

A direct but lower contribution to poverty alleviation is found in initiatives focusing on increasing production efficiency. The projects in the category of empowerment and social inclusion indicate, not surprisingly, higher levels of empowerment and limited economic impact.

Reasons for the lower than expected economic impact was discussed in focus group meetings with project partners and end users in the different countries. They concluded that economic impact percentages after two years of between 30% and 50% were acceptable, taking into account the difficulties with the implementation of ICTs in rural areas. A series of recommendations to increase economic impact of such projects are presented in the following chapter.

¹⁵ Gerster and Zimmerman 2003.

The impact of the different types of interventions is presented below.

Table 7 - Direct and indirect impact of different types of interventions

MDG 1 'Poverty'	ICT supported interventions	Empowerment	Economic impact
1	Conducive policy environment	<ul style="list-style-type: none"> • ICT policy and strategy development in the agriculture sector • Coordination and systematisation of agricultural information 	<ul style="list-style-type: none"> • High indirect impact • Low indirect impact
2a	Increased profitability	<ul style="list-style-type: none"> • Price information systems 	<ul style="list-style-type: none"> • High indirect impact
2b	Increased market access	<ul style="list-style-type: none"> • Marketing and selling online • Facilitating contacts between producers and suppliers • Circulating information about market conditions and export requirements 	<ul style="list-style-type: none"> • High indirect impact
2c	Increased production efficiency	<ul style="list-style-type: none"> • Enhancing access to information and expertise about effective traditional and modern production methods 	<ul style="list-style-type: none"> • Low indirect impact
3	Political empowerment and social inclusion	<ul style="list-style-type: none"> • Enhancing social status by use of ICT • Increasing negotiating power of farmers • Access to information on land rights/cadastre • Rural access to ICT 	<ul style="list-style-type: none"> • High direct impact • Low direct impact



Pricing up for the cattle market, Kaya, Burkina Faso

5. Practical Lessons learned

‘The success of innovative ICT projects partly depends on external factors which cannot all be influenced by a single project.’ (Raymond Gallusser, SDC).

The experiences described in the preceding chapters form the basis for extracting lessons learned to assist policymakers and practitioners in the North and the South when formulating and implementing projects and programmes in the area of ICT in the agriculture sector. Important inputs were provided by IICD partners at a validation workshop on ICT in agricultural livelihoods in Uganda in 2005. The following key factors for success are deduced from IICD’s experience to date and are described in more detail hereafter:

- Participatory and integrated project design
- Local ownership
- Relevant content
- Capacity development
- Rural access
- Learning and knowledge sharing mechanisms
- Integration at institutional and policy levels

5.1 Participatory and integrated project design

IICD partners indicated that the success of projects depends greatly on the initial project design. The following lessons learned were shared:

Ensure active participation of users

The best way to ensure that projects are demand-responsive is to involve the target groups as early as possible in the formulation process, and to complement this with an information needs assessment. Often it is assumed that users can not easily define their own needs, as they are not aware of the possibilities offered by ICT. In fact, it has been found that users are aware of and able to articulate their information and communication needs. However awareness rasping on the possibilities of new technologies is required too.

Use an integrated approach

Projects which use ICT are often perceived to be solely centred on technology. A preoccupation with technology can detract attention from the project objectives and leave out essential components. For example, sole emphasis on installation of equipment and establishing connectivity can interfere with other key activities such as development of content and training of users in information management. An integrated approach is necessary, whereby the project goals are aligned with the goals of the implementing partner, focussing on agriculture and rural communities.

Build in flexibility

Although an overall project plan is necessary from the start, it should not be too technology-specific. The emphasis in the plan should be on achieving goals, not implementing specific technologies. Maintaining flexibility is important because the range of available technologies is constantly changing. This occurred in the ABIS project in Jamaica, where several months were spent designing an ICT system, only to discover at the end of the process that a cheaper, easier solution had become available. Project partners stressed the need to introduce ICTs gradually, starting with simple applications and proceeding to more complex tools as they become necessary, accompanied by capacity building and attention to organisational information and communication processes.

Consider cost-effective and sustainable applications

Prospects for financial sustainability need to be addressed at an early stage of project formulation. Technology choices should consider the financial capacity of the project partner and users, if cost-recovery through user fees is an option. Partners pointed out that the costs of connectivity and maintaining equipment are often underestimated, and these may need to be supported beyond the start-up phase. In general it is found that support is required for at least two years of project implementation.

Take the socio-cultural context into account

Local socio-cultural factors are important in the implementation of ICT projects. Case studies of the CROMABU project in Tanzania and STMVGA in Jamaica confirm this. In the CROMABU project, which disseminates market prices and other agricultural information via local information centres, the project encountered resistance in the community. The majority of people in the Magu District project-region belong to the Sukuma ethnic group, in which information is seen as a collective good that should not be disseminated on an individual level.

Promote participation of women

To achieve a higher impact on poverty alleviation more awareness is required as well as explicit actions to encourage and facilitate the participation of women. Both Northern and Southern partners need to take a more proactive approach to include women as a target group, especially during the project identification and formulation processes. Monitoring of gender balance in projects is essential, as is further research to further our understanding of the gender impact of ICTs. IICD and its partners Technical Centre for Agricultural and Rural Cooperation (CTA), The International Development Research Centre (IDRC) and Hivos have created the GenARDIS Small Grants Fund,

which supports innovative activities that contribute to the understanding of gender issues in ICTs, and to the gender-sensitive application of ICTs in agricultural and rural development.

5.2 Ownership

Ownership is crucial to the sustainability of development activities. Initiatives will not be sustained without local 'owners' taking up responsibility for pursuing activities after the initial project phase. Over the years, IICD learned that ownership is not a given; it needs to be built over time. Several suggestions are made by the project partners to build ownership among partners and user groups.

Take time to build relationships and develop 'chemistry'

The projects described in this study have taken between six and twelve months to formulate. Although time-consuming, partners indicate that much is learned during the formulation phase which can avert problems in the later phases. This process also gives time to develop trust and understanding, which takes place through social activities and experiencing difficult moments together. A strong champion can be the key to success, but steps need to be taken to ensure that all members of the team take responsibility and feel a sense of achievement and ownership in the results.

Negotiate conditions of the partnership

Clarify interests, expectations and goals and discuss contributions of all parties involved, including knowledge, experience, skills, and time. Funding agencies and project partners often set pre-fixed conditions, leaving no space for negotiation. A more open approach and clarity is required at the onset. Also it is important to determine at an early stage who will be responsible to pay for future services.

5.3 Relevant content

Whether information comes from the scientific community or from local knowledge sources, it is essential that it is relevant for addressing needs of local communities. To this end, the following recommendations can be made:

Develop content in response to demand

Demand and relevance go hand in hand. Information produced in response to demand is more likely to be used and even paid for. Even when the services provided by a project are based on clearly articulated demands it is not uncommon to find that the information is little used. Reasons can be lack of awareness, indicating a need for marketing of the information services among the target population. Sometimes people

need training to learn to interpret and apply information to improve their livelihoods. This is more easily accomplished when the information is used within small locally-based groups.

Combine local and (inter)national content

Knowledge has greater weight in decision-making if it comes from a trusted source. The collection of relevant local content is time consuming and expensive, as information is often only available as embodied (tacit) knowledge. Efforts for documenting local knowledge are to be supported. The emphasis should be directed towards customising knowledge for local users. This may involve localising technical information on agricultural production, using graphs or other multimedia means, translating it into local languages and ensuring dissemination and use. Combining local content and information from government, research and extension agencies, civil society as well as interknowledge exchange networks is recommended.

With connectivity and equipment becoming cheaper and easier to use, two-way flows of information between end-users and other user or experts is increasingly feasible. It helps in validating and adjusting information and knowledge.

Focus initially on selected information for particular target groups

A controversial issue in the ICT4D community is the choice between offering a wide number of services, or focus on a specific topic. Many ICT projects have failed because they cast the net too wide at the outset. Much time was taken to collect all sorts of information, often of lower quality, and not directly responding to urgent needs of the target group. From experience it is found that it is better to begin with a limited but relevant and high quality information service. Early success establishes an audience and paves the way for an expansion into other types of service based on demand.

5.4 Capacity development

IICD places a great emphasis on capacity development, one of the aspects of its programme most valued by partners and end-users.

Martin Lopez of CEBROPOL in Bolivia described what he sees as the key success factor for projects and institutions working in development: human resources. 'This relates to the skills, capabilities, talents, charisma and affinity of the people involved. Projects related to poverty reduction, rural development, social development, etc. require a certain affinity with the type of activities undertaken. They require dedication and pleasure in working with people.'

Project-focused training

ICT training should be focused as much as possible on practical on-the-job use of applications in line with the project objectives.

Develop multiple capacities

ICT projects require training in technical skills to install and maintain ICT applications, but project partners also require training in 'soft skills' such as information management and project management. Especially since use of ICT in organisation brings along institutional changes it is important to involve various segments of the organisation.

Continued capacity development

Staff within project teams can change within the lifespan of a project and departure of trained staff can impede progress. IICD makes efforts to ensure that training and advisory services are available to project partners. When specific expertise is not available locally, it is called upon from abroad and core elements are integrated into the local curriculum. Another strategy to counter the effects of staff turnover is a train-the-trainer methodology, whereby trained staff are encouraged to transfer their skills to others within their team and institution.

5.5 Rural access

IICD and partners are continuously searching for cost-effective technical and management models to sustain more than 200 agriculture information centres that deliver services to rural communities in nine countries. In order to sustain their operations, rural information centres usually charge customers for services provided on site, such as Internet access, access to computers, phone calls, photocopying and printing. Often the centres operate in an adverse environment, beset by high telecommunications and connectivity costs, poor infrastructure, equipment breakdowns, and an underdeveloped market for their services due to low literacy rates and limited purchasing power. In this environment cost-recovery and sustainability are a daily challenge.

Seek innovative connectivity solutions

To bring costs down, partners have found innovative ways to share cost of connectivity between institutions in the community. In some areas project partners using satellite or radio-based Internet connections are sharing bandwidth and costs with local governments, schools, health posts and private businesses. IICD is also experimenting with technologies such as mesh box to create wireless networks linking various local institutions in towns and villages.

Increase the number of rural access points

Farmers are expected to visit to the rural access points to benefit from agriculture information services. Project partners in Uganda realised that the location and the accessibility of those access points are therefore crucial. Many project partners aim to increase the number of access points, and create dense networks of rural centres in a particular region.

Monitor usage of the information

It is necessary to monitor whether the right target groups are reached. In some projects the wider public and students use the services for personal, educational and entertainment purposes rather than to obtain agricultural information. In response some partners have installed additional computers in centres to cater for both the needs of the target group of farmers and other users. The expansion is sustained by introducing a payment system for casual visitors.

5.6 Learning and knowledge sharing mechanisms

ICT is a new instrument for poverty alleviation, requiring a learning-by-doing approach. This must be complemented by mechanisms to share knowledge between project partners and users.

Participatory monitoring and evaluation

A participatory M&E system enables stakeholders to evaluate their actions in a critical way and address the challenges identified. The approach introduced by IICD, described in the previous chapter, is one example of such a mechanism. In Burkina Faso, teams involved in new livelihoods projects are brought into 'mirror groups' to discuss issues and share lessons learned. Such a structured approach also helps to build trust and lays the groundwork for learning communities of practice.

Support knowledge sharing mechanisms

Often ICT projects are developed in isolation, with limited opportunities for project teams to learn from and share experiences with others. Pilot projects are only valuable if the experiences and results are documented and disseminated. Peer exchanges and knowledge exchange networks in a country can help break down the isolation of pilot projects and help to scale up projects and influence policy.

Knowledge exchange networks

IICD and partner organisations have set up knowledge exchange networks as a component of the country programmes in the nine focus countries. The networks facilitate the exchange of experiences between partner organisations and document

and disseminate the experiences via printed materials, websites and off-line and on-line discussion platforms. The networks facilitate knowledge exchange and documentation of experiences that cross national, ethnic and social boundaries.

The networks are also instrumental in influencing sector and national ICT policy processes. Apart from direct exchanges of experiences the networks are instrumental in policy processes by involving of various stakeholders. For example, crucial for the success of the agriculture policy process in Bolivia was the incorporation of lessons learned from grassroots organisations within the TICBolivia network of IICD partners.

Thematic networking

IICD also makes efforts to harvest and disseminate experiences on a thematic basis between the nine focus countries and put it in international perspective. Face-to-face learning events on specific themes such as agriculture bring together practitioners from different countries, enabling them to share experience. It allows for collective understanding what works and what does not in their field of work. Eventually these events will grow into thematic networks that link experts and practitioners across countries on a regular basis. Studies such as this one are among the products of such thematic activities.

5.7 Integration of ICT at organisational and policy level

In order to have an impact, pilot projects and ICT usage must be integrated into the daily work of the project partners and also within the policy level for the sector.

Organisational integration

Every institution tends to harbour champions for ICT innovation, who are often the driving force within an ICT pilot project. However, in order for pilots to succeed it must have a wider base of support within the institution. The value and relevance to the core mission of the organisation must be understood by management in particular, and their interest is agriculture. Integration is also required at the level of the target group. An example is the CIOEC project, in which ICT enables farmer groups to bid on public tenders. Whereas initially some user groups had reservations about the project, the service became a priority for the farmers after one year and the farmer groups are determined to sustain the activity.

Sector and policy integration

Individual projects are more likely to be expanded and replicated when they are integrated in government-supported policies and programmes in the agriculture sector. The ICT for agriculture strategy process in Bolivia, described in Chapter 3, is an example

of this. Project partners representing grassroots organisations and NGOs collaborated in the knowledge exchange network TICBolivia, forming a strong and experienced lobbying platform. They were then able to participate in the formulation of the government's ICT policy and strategy. They successfully promoted an integrated approach to the ICT policy process focusing on poverty alleviation. The government has the primary role of coordination and channelling funding to the wider implementation of ICT in the agriculture sector. A challenge is to ensure that the experience of partners is translated into a role in helping to implement the policy.

Davy Simumba, coordinator of the ZARI project in Zambia relates his experience in dealing with this issue: 'During the formulation stage of the project, decision-makers did not understand the value of the project for the organisation. It was alleged that the project was basically for technology experts.' In response, IICD involved a consultant to coach Simumba in engaging decision-makers. In addition, workshops were held to introduce the project to key stakeholders. Finally, training was held to improve ICT-skills of project management, technical support staff and thematic experts. The training contributed to better understanding of the scope and potential of the project.

6. Conclusions and recommendations

6.1. Impact of ICT in agriculture projects

Analysis of the impact of the thirty-five IICD-supported projects indicates that ICT can contribute to achieving the first Millennium Development Goal to 'eradicate extreme hunger and poverty'¹⁶ by raising the income of small-scale farmers and strengthening the agriculture sector. In addition ICT contribute to better access to prices, markets and production information.

The projects reach predominantly lower-income users in rural areas and enhance their capacity to take informed decisions and strengthen their negotiation position.

The majority of users are highly satisfied with the projects, which have raised their awareness on the use of ICT. Some 50% of persons involved in the projects describe themselves as more empowered, and 35% experience direct positive effects on their income for the projects, which is lower than initially may be expected.

An explanation is that projects go through an initial phase of awareness raising and skills development which only thereafter lead to direct empowerment and economic impact. It takes time before the human capacity, tools and content are developed and lead to actual economic benefits for end-users. Analysis of four projects where M&E data have been collected over several years indicates that after two years the levels of empowerment and economic impact increases with some 20%. This suggests that it pays off to sustain support for several years.

Clear direct impact is registered by ICT projects focusing on price information and market access. Direct but less strong impact on poverty is found with projects supporting efficiency and sustainability of agricultural production and projects focusing on political empowerment. Developing national policies that include use of ICT and streamlining agriculture information systems can contribute to a more conducive environment for agriculture development and high, but indirect, impact on poverty alleviation.

Analysis of M&E data indicates that 30% of the users are female while 70% are male. This is an issue of concern given that the majority of the world's poor are women¹⁷ and that women play a central role in agriculture. Illiteracy and heavy workloads are among the factors that inhibit women from participating. Cultural attitudes also prevent women from attending meetings or visiting rural centres.

¹⁶ *United Nations Millennium Declaration*. United Nations Resolution 55/2, September 2000.

¹⁷ United Nations Department of Public Information, 2003. *Empowering Women: The Key to Achieving the Millennium Development Goals*.



Local town in Sélingué, Mali

6.2 Recommendations for implementing projects and mainstreaming ICT in agriculture

Several recommendations can be made to support future activities in realising the full potential of ICT to alleviate rural poverty and strengthen the agriculture sector in developing countries. They are based on the lessons learned of IICD to date with project implementation and impact analysis of activities in support of the use of ICT in the agricultural sector. They include inputs of IICD partners during a workshop in Uganda in 2005.

Use a participatory and integrated project design

The participatory and systematic approach of IICD in project formulation and implementation was positively evaluated by project users. The 'package' includes awareness raising seminars, targeted capacity development, participatory project formulation and monitoring & evaluation activities. These are linked via a knowledge sharing mechanism. Specific recommendations are the following:

- a. Carry out an information needs analysis and take the local cultural context into account
- b. Facilitate active participation of users in the formulation phase
- c. Monitor the profile of the target group and if necessary re-direct project activities towards increased participation of low-income users.
- d. Monitor the gender balance and ensure participation of women during formulation and implementation.
- e. Ensure that the project is aligned with the core business of the implementing partner
- f. Include a budget for the maintenance of ICT
- g. Ensure project support for at least 2-3 years. It takes time to raise awareness, develop a relevant information service with functional tools and relevant content, build up human capacity and a support structure.

Foster ownership

Ownership of the project by the local partner in design and implementation is essential. It is also crucial to the sustainability of development. Recommendations to foster ownership are the following:

- a. Take time to build relationships and develop a conducive working environment
- b. Negotiate conditions of the partnership including roles, tasks and outputs.

Ensure availability of relevant content

It is crucial that content is available that addresses key needs of end-users. Price information is generally highly valued. The following recommendations can be made:

- a. Provide information that addresses local needs. It should be context-specific, delivered timely and accurately and presented in an appropriate language and format

- b. Develop and disseminate local content complemented with information from government, civil society and research institutions and networks
- c. Track information-use by simple, gender- and age disaggregated monitoring methods
- d. Carry out research of local socio-cultural attitudes towards information, communication and technology, before implementation
- e. Focus initially on 1-2 types of information in order to build up a relevant information service for the specific target group
- f. Foster a two-way flow of information. Equipment is becoming cheaper and easier to use.

Include continued capacity development

Developing human capacity to use, manage and develop ICT is important. As modern ICTs are rather recent technologies ample capacity needs to be developed. Introducing ICT in organisations goes together with institutional changes. It is recommended to:

- a. Focus the training on practical project-related tasks and the local situation
- b. Include both technical and 'soft skills' including project management
- c. Develop technical, managerial as well as train-the-trainer capacity. The focus is on the use and management of the content, developing and maintaining ICT systems and use of ICT in the organisation- and development process
- d. Continue capacity development efforts during the project to absorb staff turnover
- e. Develop a training and support mechanism to provide partners with access to knowledge and skills when external support ends.

Use various ICT options

IICD's experience indicates that combining various ICTs can overcome problems of rural access. Options include Internet access through V-Sat systems or dial-up lines, local radio, two-way radio, mobile telephone, use of multimedia and drama. The most suitable combination depends on the specific social context and infrastructure. Projects which scored high on impact combine modern and traditional ICTs. Internet based systems offer large potential but require more efforts in terms of capacity development, infrastructure and information management skills. However connectivity options for rural areas are developing steadily, young people are picking up Internet skills quickly and the possibilities for web-based sharing and managing information increases rapidly. Connectivity via satellite is increasingly available but brings along recurrent subscription- and maintenance costs. A promising option is sharing connectivity costs among several users in a community (e.g. school, local government and health offices, agricultural information centre). Mobile phones should be

considered among technology options for disseminating information.

Specific recommendations are:

- a. Seek suitable connectivity solutions and combine new and traditional ICTs, where appropriate
- b. Focus on sustainability of ICTs. Explore cost sharing options for satellite connectivity among various local groups. Fees from casual users may be used to subsidise services for farmers
- c. Monitor new developments in ICT both in hardware, connectivity and information systems and include cost effective and efficient innovations in the design and implementation of ongoing and new activities.

6. Include Learning and knowledge sharing mechanisms

ICT4D is a new and dynamic field and continued learning and sharing of experiences with peers and others is necessary to enhance effectiveness and efficiency of activities. Much can be gained by documenting and sharing experiences among partner organisations. Recommendations include:

- a. Document and share experiences on the impact with ICT in agriculture
- b. Develop mechanisms for learning between partners and other practitioners at various levels. This includes:
 - a participatory monitoring and evaluation system that emphasises learning-by-doing
 - country knowledge exchange networks for capturing and sharing lessons learnt and innovations in the use of ICT4D
 - cross-country learning to allow exchange and synthesis of information between various countries. Direct exchanges between practitioners are to be combined with web-exchanges.

7. Integration of ICTs at organisation level

Projects require a certain amount of time before they are well established. It is essential that successful projects can be sustained through the integration at institutional and sector level. Recommendations are:

- a. Address the sustainability of the project right from the start. Integration of projects in the strategic objectives and implementation programmes of partner organisations needs attention in all project phases
- b. Set realistic targets and be aware that the project has to go through various phases of awareness raising, capacity and content development before it generates economic impact. This will take at least one to two years to materialise
- c. Start with content that is easy to produce and relevant for farmers and disseminate it via appropriate combinations of media such as Internet, multimedia, TV, radio and

drama. Meanwhile build capacity and infrastructure for more advanced Internet-based systems to support agricultural livelihoods

- d. Involve decision makers of the partner organisation in the process.

8. Mainstreaming ICT in the agriculture sector

A conducive policy environment is necessary to foster the use of ICT to enhance rural livelihoods. In addition the use of standards and common or compatible systems is beneficial to make information easily accessible for end-users. Specific recommendations to achieve this are:

- a. Raise awareness on the potential impact of ICT on poverty alleviation. There is still a clear need to raise awareness within governments and the international donor community and provide experiences to illustrate the potential use of ICT4D
- b. Integrate ICT in national policies and programmes. This is important for enhancing the competitiveness and sustainability of the agriculture sector. To avoid pitfalls and build on what works, it is important that the experiences and lessons learned within projects such as those supported by IICD are part of the policy process
- c. Collect and document evidence of impact and on-the-ground experiences of ICT pilot projects. This provides a strong basis for influencing and participating in the development and implementation of pro-poor ICT policies and strategies in the agriculture sector
- d. Involve multi-stakeholder networks to bring in experiences of ICT projects and user perspectives from the agricultural sector. Through the national knowledge exchange networks, civil society participates actively in the policy process
- e. Foster national interaction in an international context to harmonise standards and systems for sharing agricultural information and thereby make it more easily accessible to end-users.

Annex 1 - About IICD

About IICD

The International Institute for Communication and Development (IICD) is an independent non-profit organisation that specialises in information and communication technology (ICT) as a tool for development in sectors education, health, livelihoods (mainly agriculture), health and to a lesser extent, environment. By working with local stakeholders – national and local governments, non-governmental organisations (NGOs), grass root organisations and the private sector – IICD aims to build partners' capacity to formulate, implement and manage development policies and projects that make effective use of ICT. Currently, IICD is involved in nearly 100 project and policy making activities in Bolivia, Burkina Faso, Ecuador, Ghana, Jamaica, Mali, Tanzania, Uganda and Zambia.

Programme components

IICD realises its mission through two strategic approaches. Firstly, Country Programmes bring local organisations together to help them formulate and execute ICT-supported development policies and projects. Country Programmes are strengthened by a comprehensive capacity development programme focusing on ICT skills for project partners, and a system of in-country networks that create a platform for knowledge sharing among partners in IICD supported projects in each country. Secondly, Thematic Networks link local and international partners working in similar areas, connecting local with global knowledge and promoting South-South and South-North exchanges.

Funding

Funders include the Netherlands' Directorate-General for Development Cooperation (DGIS), the UK Department for International Development (DFID) and the Swiss Agency for Development and Cooperation (SDC). Furthermore, IICD maintains large-scale co-funding arrangements with the Dutch development organisations CORDAID, Hivos and PSO.

Guiding Principles

IICD's approach to ICT-enabled development is built on seven guiding principles:

- 1) **Ownership**, whereby IICD's local partners are ultimately responsible (and willing to be responsible) for the results of IICD-supported activities. This takes place on a national level where local organisations take responsibility for the overall Country Programmes. At the project and policy level, individual implementing organisations already 'own' the projects they have developed. In both cases, the owners also need to make sure that their partners or beneficiaries take ownership of the plans and results.
- 2) **Demand responsiveness**. 'Pro-poor' activities must respond to local demands and offer location-specific solutions. By involving the 'consumers' - doctors, teachers,



Chevrina the TV goat (IABER project), Burkina Faso

Annex 2 - Millennium Development Goals and targets

policy makers or poor people - IICD ensures that the ICT activity is kept close to the 'market' and therefore relevant and demand responsive.

- 3) **Multi-stakeholder involvement.** Public, private and non-profit actors are actively involved in the identification, formulation and implementation of activities. Efforts are made by IICD to maintain a balance among its participating partners and it encourages approaches that safeguard open and full participation to avoid situations where stronger partners dominate or manipulate the process.
- 4) **Capacity development.** When necessary, IICD helps its local partners to acquire the institutional capacities and individual skills required to make effective use of ICTs for development purposes.
- 5) **Partnerships.** Joining with other organisations is the only feasible way for IICD to fulfill its mission. Consequently, IICD works with various kinds of local partners, the change agents that work with and for poor people. Responding to real local demands, they devise and implement suitable development and poverty-reducing interventions, including any uses of ICTs. They are the owners of the activities that IICD supports. Strengthening the ability of these partners to understand and apply ICTs for development is essential. Beyond and behind these partners, various enabling partners from the private, public or non-profit sector, share expertise and contribute financial resources to help ensure that local activities are sustainable.
- 6) **Learning by doing.** This is an area with a growing demand for concrete lessons and tools that can be borrowed, adapted if necessary, and applied. On a practical level, this means strengthening the monitoring and evaluation capabilities of local IICD partners. It also means generating and disseminating knowledge and lessons learned for the wider benefit of IICD's partner organisations in particular, as well as for national policy makers and the international community in general.
- 7) **Gender equality.** Women are prominent stakeholders in the social change process as they comprise the larger percentage of disadvantaged groups. Despite the important role women play in livelihoods and economic development, men continue to dominate decision-making, capacity development and content development. Therefore, IICD stimulates project partners proactively to incorporate the needs of strong end-users – women – during the analysis of the project design.

Goal 1 Eradicate extreme poverty and hunger

Target 1. Halve, between 1990 and 2015, the proportion of people whose income is less than \$1 a day

Target 2. Halve, between 1990 and 2015, the proportion of people who suffer from hunger

Goal 2 Achieve universal primary education

Target 3. Ensure that, by 2015, children everywhere, boys and girls alike, will be able to complete a full course of primary schooling

Goal 3 Promote gender equality and empower women

Target 4. Eliminate gender disparity in primary and secondary education, preferably by 2005, and in all levels of education no later than 2015

Goal 4 Reduce child mortality

Target 5. Reduce by two-thirds, between 1990 and 2015, the under-five mortality rate

Goal 5 Improve maternal health

Target 6. Reduce by three-quarters, between 1990 and 2015, the maternal mortality ratio

Goal 6 Combat HIV/AIDS, malaria, and other diseases

Target 7. Have halted by 2015 and begun to reverse the spread of HIV/AIDS

Target 8. Have halted by 2015 and begun to reverse the incidence of malaria and other major diseases

Goal 7 Ensure environmental sustainability

Target 9. Integrate the principles of sustainable development into country policies and programs and reverse the loss of environmental resources

Target 10. Halve, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation

Target 11. Have achieved by 2020 a significant improvement in the lives of at least 100 million slum dwellers

Annex 3 - IICD supported projects and policy processes

Overview of projects in agricultural livelihoods

Goal 8 Develop a global partnership for development

Target 12. Develop further an open, rule-based, predictable, non-discriminatory trading and financial system (includes a commitment to good governance, development, and poverty reduction (both nationally and internationally))

Target 13. Address the special needs of the Least Developed Countries (includes tariff- and quota-free access for Least Developed Countries' exports, enhanced program of debt relief for heavily indebted poor countries [HIPCs] and cancellation of official bilateral debt, and more generous official development assistance for countries committed to poverty reduction)

Target 14. Address the special needs of landlocked developing countries and small island developing states (through the Program of Action for the Sustainable Development of Small Island Developing States and 22nd General Assembly provisions)

Target 15. Deal comprehensively with the debt problems of developing countries through national and international measures in order to make debt sustainable in the long term

Some of the indicators listed below are monitored separately for the least developed countries, Africa, landlocked developing countries, and small island developing states

Target 16. In cooperation with developing countries, develop and implement strategies for decent and productive work for youth

Target 17. In cooperation with pharmaceutical companies, provide access to affordable essential drugs in developing countries

Target 18. In cooperation with the private sector, make available the benefits of new technologies, especially information and communications technologies

Bolivia	
<p>Agricultural information and monitoring systems in the valleys of Santa Cruz Instituto de Capacitación del Oriente (ICO)</p>	<p>ICO has established five agricultural information centres with Internet access in the region of Vallegrande. The project collects and disseminates prices for key commodities in the Santa Cruz markets and broadcasts them widely through the centres and the radio programme, El Correo del Agricultor, which has an audience of 60,000 people throughout the region.</p>
<p>Commercial information and advisory system for agriculture producers Centro de Promoción Bolivia (CEPROBOL)</p>	<p>This project aims to enhance the capacity of the Bolivian Export Promotion Centre, an executive institute under the Ministry of Foreign Affairs, to use ICTs effectively for the promotion of Bolivia's agricultural exports. With IICD support, CEBROPOL has developed a more targeted and effective system for providing export guidance to agricultural producers across the country.</p>
<p>Chuquisaca marketing information system Fundación Acción Cultural Loyola (ACLO)</p>	<p>Through a radio station, a newspaper and training workshops, ACLO helps empower indigenous people in the Chuquisaca department of southern Bolivia. Radio ACLO broadcasts in Spanish and Quechua to a listening audience of over half a million people. Programming includes agricultural advice and market prices, news, culture and literacy programmes, public service announcements and entertainment.</p>
<p>ICT for agriculture in the Chiquitano region Apoyo Para el Campesino-Indígena del Oriente Boliviano (APCOB)</p>	<p>APCOB is working with the indigenous people of eastern Bolivia to assist in the conservation and transfer of indigenous knowledge and sustainable agriculture practices. Together with different indigenous groups, APCOB is creating multimedia educational modules that document their history and culture.</p>
<p>ICT for the exchange of farmer experiences in ecological agriculture Fundación Agrecol Andes</p>	<p>In this project, the NGO Agrecol Andes is training Andean communities to use ICTs such as digital cameras and multimedia presentations to document and communicate their local environmental issues and traditional agricultural practices. The ICTs used are suited to the primarily oral/visual communication culture of the communities.</p>

<p>ICT strategy for the agricultural sector – Bolivia Ministerio de Agricultura, Ganadería y Desarrollo Rural (MAGDER)</p>	<p>In 2002, IICD supported the development of an ICT strategy for the agricultural sector in Bolivia. The objective of the strategy is to ‘coordinate and promote the introduction, access, uses and application of ICT in order to improve rural development in a more sustainable and participatory way, with particular attention to impoverished sectors.’</p>
<p>Information system for innovation and competitiveness of small farmers Centro de Promoción Agropecuarios Campesino (CEPAC)</p>	<p>Operating in the Ichilo Province in the Department of Santa Cruz, this project is setting up regional information centres that will provide agricultural information including market prices to rural communities. CEPAC is also producing a daily radio bulletin, Vamos al Mercado, which broadcasts the latest market prices throughout the region.</p>
<p>Information on Conflicts and Negotiations in Communitarian Original Indigenous Lands Confederación de Pueblos Indígenas de Bolivia (CIDOB)</p>	<p>Since 2001 CIDOB has developed an information system (database and website) to support land-right claims for indigenous groups in Bolivia. Information is also used to lobby for action at government and international level. The project includes efforts to improve internet access at local level and provides training to indigenous leaders in rural areas.</p>
<p>Information System on Public Investment for Small Producers in Agriculture Coordinadora de Integración de Organizaciones Economicas Campesinas de Bolivia (CIOEC)</p>	<p>The project supports organisations in terms of access and information on public funds for productive investments and farmers are guided in the submission process. An electronic information (database) system in CIOEC is developed and communication (e-mail) system between CIOEC and organisations is improved. CIOEC and organisations are trained in basic ICT and management of information processes. Initially the project will work with 34 farmer organisations out of the 300 affiliated organisations around Bolivia.</p>
<p>GIS system for certification of cacao producers CEIBO, CEPROEST</p>	<p>Building on an independently sustainable project that built 14 information centres, this new project will provide an application that will automate and facilitate the international certification processes thus improving productivity and income of some 3,000 cacao producers. Similar projects in Mexico have indicated that this is a well worth application that has resulted in both lower costs and higher productivity of the participating farmers, thereby having a positive impact on income.</p>

<p>Technical-commercial information centres for the agro-ecological sector Asociación de Organizaciones de Productores Ecológicos de Bolivia (AOPEB)</p>	<p>This project supplies information on production, certification and marketing of organic products through six regional information centres in five Bolivian departments. The project also involves development of a website and training of information providers and end-users. The main beneficiaries are the 51 members of the AOPEB network of organic producers, representing 30,000 families. The project has contributed to the identification of new buyers in Europe and the US for Bolivia’s organic products.</p>
Burkina Faso	
<p>Business Intelligence Trade Points Fédération nationale des industries de l’agro-alimentaire et de transformation du Burkina (FIAB)</p>	<p>The Business Intelligence Trade Point for the agro-business sector is a project designed to address the socio-economic exclusion of small-scale farmers in Burkina Faso. This project will provide both the access to market information - via the internet - and the training in capacity building required for information retrieval and analysis - via computer software applications. It aims to strengthen the competitiveness of the small agro-business producers and traders through an effective and efficient agro-business information facility.</p>
<p>Improvement of agriculture-related information channels to farmers in the rural area of Sissili Fédération provinciale des producteurs agricoles de la Sissili (FEPPASI)</p>	<p>The goal of this project is to set up two small telecentres in the villages of Bieha and Boura in the district of Leo to help to strengthen communications between the FEPPASI farmers’ federation called and its up-country membership. FEPPASI staff and its more active members will be trained to use multimedia tools to produce and disseminate agricultural information.</p>
<p>Improvement of internal communications in the shea butter sector (MIPROKA) L’Association Songtaaba - Yalgré</p>	<p>Songtaab-Yalgré is an association of women producers of karité (shea butter), a commodity used in many cosmetics. Through the establishment of small information centres (MIPROKA) in two rural towns, the women are improving communication and information channels between Songtaab-Yalgré headquarters in Ouagadougou and members in the regions.</p>
<p>Market price information system using web and national television in Burkina (TV-Koodo) Institut africain de bio-économie rurale (IABER)</p>	<p>This project is broadcasting market prices and raising awareness of agriculture and food security issues through a popular television programme called TV Koodo, which is being shown on national TV. The show’s wide circulation of livestock and commodity prices is creating a more level playing field between producers and middlemen. The information disseminated in the programme is supported by a website maintained by IABER.</p>

Ecuador	
<p>Communication to manage sustainable production systems – Pests and diseases Coordinadora Ecuatoriana de Agroecología (CEA)</p>	<p>The Coordinadora Ecuatoriana de Agroecología (CEA) will help promote environmentally sound methods of protecting crops against agricultural pests and diseases. Using a range of media it will work with farmers and researchers within their network to document techniques – both modern and traditional – and disseminate these approaches through community-based information centres.</p>
<p>ICT for the optimisation of production, marketing and social organisation of cacao growers in Ecuador Maquita Cushunchic Comercializando como Hermanos (MCCH)</p>	<p>MCCH Foundation works with 33 cacao producing organisations representing 800 cacao growers throughout Ecuador – four percent of the total cacao sector for the country. This project will strengthen and diversify the use of ICT for information management and communication by MCCH. Existing information/communication centres will be upgraded and MCCH will put in place a web-based information system as well as radio, audiotape and video information packages for producers. The project is piloting the use of shortwave wireless technology for rural Internet connectivity.</p>
<p>Impacts of free trade on agriculture Acción Ecológica</p>	<p>Acción Ecológica is using ICTs to generate awareness among farmers and other grassroots organisations about the impact of trade liberalisation on Ecuador’s agriculture sector, environment, and indigenous communities. Among other activities, Acción Ecológica is producing regular e-bulletins, a CD-Rom and radio series in Spanish and Quechua. Acción Ecológica is collaborating with another IICD-supported project, CAMARI, to disseminate its message.</p>
<p>Strengthening the information and training network for producers working with the Camari- FEPP fair trade system Sistema Solidario de Comercialización del FEPP (Camari/FEPP)</p>	<p>Camari is a fair trade marketing board that works closely with agricultural producers allied to the UNEP award-winning Ecuadorian social fund known as FEPP. With IICD support, Camari is introducing ICTs into its system of matching producers and buyers and undertaking other activities designed to help farmers strengthen their negotiating position in the international marketplace. The project has already resulted in increased annual sales of over than \$40,000.</p>

Ghana	
<p>Eastern corridor agro-market information centre (ECAMIC) Social Enterprise Development Foundation of West Africa (SEND)</p>	<p>This project uses ICTs to help 500 soybean-producing farmers in eastern Ghana gain access to markets. The project will provide connectivity to isolated communities as well as support to the development of specialised information and communication services to improve the livelihoods of the farmers involved in the SEND Food Security Project.</p>
<p>Ghana agricultural information network system (GAINS) Institute for Scientific and Technological Information (CSIR-INSTI)</p>	<p>The goal of GAINS is to link agricultural research institutions into a network to collect, process, share and repackage for dissemination, agricultural information generated in Ghana or elsewhere in any format to support agricultural research and development in the country.</p>
<p>E-Commerce for non-traditional exports Ministry of Food and Agriculture (MOFA)</p>	<p>Through this project the Ministry aims to enable Ghanaian non-traditional producers and exporters to effectively promote their products in the global market. It resulted in the creation of a website with information on market prices, production, international trade, non-traditional producers and traders and agricultural information centres.</p>
<p>ICT policy process in agriculture – Ghana Ministry of Food and Agriculture (MOFA)</p>	<p>At the request of the government, IICD provided strategic advice and process support to the Ministry of Food and Agriculture for the development of a strategy for implementing the relevant provisions of the Ghana ICT for Accelerated Development Policy within the agriculture sector.</p>
<p>Market access promotion network Market Access Promotion Network (MAPRONET)</p>	<p>Formed in 2001 by agricultural producer groups and local and international NGOs, MAPRONET works to improve market access for farmers, enabling them to meet the requirements of local and international markets. IICD supports MAPRONET’s use of ICTs for better communication across the network and with target groups.</p>
<p>Market access support for agricultural partners TechnoServe</p>	<p>The aim of this project is to stimulate the flow of agricultural market information in Ghana through information centres run by NGOs and the Ministry of Food and Agriculture. The project will pilot the use of SMS for weekly price information collection and dissemination.</p>

Jamaica	
<p>Agricultural business information system (ABIS) Rural Agricultural Development Authority (RADA)</p>	<p>IICD supported the initial phases of the development of the ABIS system, which is now fully operational. Data collectors throughout Jamaica use hand-held computers to collect agricultural information that feeds into a central website operated by RADA. The information provided through ABIS enables farmers to make more informed decisions regarding what to grow and when and where to sell their harvest.</p>
<p>Central and satellite agricultural information centre (CSAIC) St. Elizabeth and Manchester Vegetable Growers' Association</p>	<p>This pilot project in rural Jamaica provided subscription-based agricultural information services to members of the Association. Three hundred members signed up for the service, which delivered information and technical advice through two Internet-connected information centres. Lessons learned are captured in a case study by Winston Graver (www.ict4djamaica.org).</p>
Mali	
<p>Use of ICT in shea butter marketing in Mali Union locale des productrices de karité de Kioila (ULPK)</p>	<p>IICD is supporting two allied producers' associations, the ULPC (devoted to cereals) and the ULPK (an association of women shea nut producers) to strengthen the livelihoods of their members by creating better market access through ICTs. This will involve training, content development, and the installation of a communication system in nine communities, as well as at the union's main office.</p>
Tanzania	
<p>Agricultural business information services (BIS) Business Care Services (BCS)</p>	<p>With IICD support, BCS developed a website and set up a network of farmer organisations and NGOs which it provides with price information and marketing expertise. The project began in Mwanza and thanks to cooperation with other organisations including VECO (a Belgian NGO) and SNV (a Dutch NGO), the project has also been able to expand its services to two more regions: Kilimanjaro and Dodoma.</p>
<p>Agricultural price and business information services (ABIS) Crop Marketing Bureau (CROMABU)</p>	<p>In Magu, on the shore of lake Victoria, the most important sources of income are cotton farming and fishing. The local telecentre set up by the ABIS project provides the community with relevant price information and training services to build ICT capacity within the community, particularly among young people, women and farmers. The project is providing Internet access to other institutions in Magu and a wireless Mesh network is being set up – a technical breakthrough for this part of Africa.</p>

Uganda	
<p>Agriculture research and rural information network (ARRIN) Ndere Troupe</p>	<p>Ndere Troupe is a cultural organisation that works with hundreds of rural drama and community groups across Uganda. With its strong grassroots network, Ndere is collecting locally relevant information for development and disseminating it using a 'media mix' that includes radio, newsletters, flyers, email, web pages, drama skits and video clips.</p>
<p>Rural information system to support a commodity exchange Uganda Commodity Exchange Limited (UCE)</p>	<p>UCE has established a crop marketing bureau through which farmers can send and receive market information. The bureau also includes a warehouse system where producers can store commodities, thus giving them greater control over when they sell their crop. The bureau's information system is linked to twelve pilot telecentres throughout Uganda.</p>
Zambia	
<p>Development of an effective information flow system Zambia Agriculture Research Institute (ZARI)</p>	<p>Zambia's Agriculture Research Institute is seeking ways to communicate in a more practical way to farmers about agricultural techniques and issues. With an initial focus on the populations around two rural towns, This project works at many levels (infrastructure, content development and training) to improve information flows between researchers, extension workers, and farmers at the grassroots so that the fruits of research can be realised in the field.</p>
<p>Farmers' information centres in Mansa and Kasama Districts Ministry of Agriculture and Cooperatives, Zambia</p>	<p>Zambia's National Agricultural Information Services (NAIS) supports national extension services by disseminating agricultural information to all players in the agricultural sector, particularly rural communities. IICD is supporting the establishment by NAIS of pilot ICT-enabled information centres serving farmers in two rural districts of the country.</p>
<p>ICT support for exporting organic products Organic Producers and Processors Association of Zambia (OPPAZ)</p>	<p>OPPAZ is currently working with 8,000 certified organic producers and wild harvesters in Zambia, helping them to reach domestic and export markets more effectively. This project will put in place a computerised system for quality assurance and certification, a service which will greatly strengthen the access to export markets of Zambia's small-scale organic farmers. of shortwave wireless technology for rural Internet connectivity.</p>

Annex 4: Partners and partnerships

Local agricultural livelihoods project partners

Bolivia

Knowledge exchange network:

- TiCBolivia – www.ticbolivia.net

Monitoring and Evaluation partners:

- Rodas consultancy

Capacity development partners :

- Cognos – www.cognos.com
- Aspire Systems – www.aspiresys.com
- Captic / EnBolivia.com – www.enbolivia.com

Project partners:

- Instituto de Capacitación del Oriente (ICO) - www.ondaslibres.org
- Centro de Promoción Bolivia (CEPROBOL) - www.ceprobol.gov.bo
- Fundación Acción Cultural Loyola (ACLO) - www.apostamosxbolivia.org/aclo.asp
- Apoyo Para el Campesino-Indígena del Oriente Boliviano (APCOB) - www.apcob.org.bo
- Fundación Agrecol Andes - www.agrecolandes.org
- Ministerio de Agricultura, Ganadería y Desarrollo Rural (MAGDER)
- Centro de Promoción Agropecuarios Campesino (CEPAC) – www.cepacbolivia.org
- Asociación de Organizaciones de Productores Ecológicos de Bolivia (AOPEB) - www.aopeb.org

Burkina Faso

Knowledge exchange network:

- Burkina-NTIC – www.burkina-ntic.org

M&E partner(s):

- GREFCO

Capacity development partners:

- Zongo's Consulting and Productions – www.zcp.bf
- SULGA Concept

Project partners:

- Feppasi (Fédération des producteurs du Sissili, Léo)
- Sahel Solidarité (Ouagadougou, Bokin) - www.sahelsolidarite.bf/index.htm
- Pag La Yiri (Ouagadougou, Zabré) - www.yam-pukri.org
- Association Song-Taab Yalgré (Ouagadougou, Boussé, Saponé) - www.songtaaba.net
- IABER (Koudougou) – www.iaber.bf

Other:

- Délégation Générale à l'Informatique - www.delgi.gov.bf

- SICAREX
- Ministry of Agriculture

Ecuador

Knowledge exchange network:

- Infodesarrollo - www.infodesarrollo.ec

Monitoring and Evaluation partners:

- Martha Nuñez consultancy

Capacity development partners:

- NUEVARED.ORG – www.nuevared.org

Project partners:

- Coordinadora Ecuatoriana de Agroecología (CEA) – www.cedenma.org/CEA.htm
- Maquita Cushunchic Comercializando como Hermanos (MCCH) – www.fundmch.com.ec
- Acción Ecológica - www.accionecologica.org
- Sistema Solidario de Comercialización del FEPP (Camari/FEPP) - www.negocios.camari.org

Other:

- Ministry of Agriculture

Ghana

Knowledge exchange network:

- Information Network on Knowledge Sharing (GINKS) – www.ginks.org

Monitoring and Evaluation partners:

- Hippolyt Pul - Development Alternative Services Foundation – www.dasfghana.org
- Prof. Baah-Nkoah, Department of Economics, University of Ghana.

Capacity development partners:

- Kofi Annan Centre for Excellence in ICT – www.aitikace.org
- LaKe Consult Ltd.

Project partners:

- Women in Development Project (WADEP) / Jaskian District Diocesan Office
- Social Enterprise Development Foundation of West Africa (SEND)
- Institute for Scientific and Technological Information (CSIR-INSTI) - www.gains.org.gh
- Ministry of Food and Agriculture (MOFA) – www.ecomghana.org.gh
- Market Access Promotion Network (MAPRONET)
- TechnoServe

Jamaica

Knowledge exchange network:

- ICT4D Jamaica – www.ict4djamaica.org
- HEART/NTA – www.heart-nta.org

Project partners:

- Rural Agricultural Development Authority (RADA) - www.abisjamaica.com.jm
- St. Elizabeth and Manchester Vegetable Growers' Association
- On The Frontier - Jamaica Competitiveness Project (COMMIT) – www.onthefrontier.com

Other:

- RADA - Ministry of Agriculture – www.radajamaica.com.jm
- Mandeville Weekly Community Development Ltd. - www.mandevilleweekly.com

Mali

Knowledge exchange network:

- Mali-NTIC /Togunet – www.mali-ntic.com

Monitoring and Evaluation partners:

- Porpé Daou consultant

Capacity development partners:

- IDC – www.reoafrique.com

Project partners:

- Union locale des producteurs de céréales / Union locale des productrices de karité de Kioïla (ULPC/ULPK)
- Fédération des Associations de Base du Mandé (FABEMA)
- Association d'Aide et d'Appui au Groupements (AAAG)

Other:

- Afribone – www.afribone.com
- CENAFOD
- Delta-C
- Ministry of Agriculture

Tanzania

Knowledge exchange network:

- SWOPnet – www.swopnet.or.tz

Monitoring and Evaluation partners:

- Dr. Magdalena Ngaiza; Clement Kwayu; Frank Tilya consultants

Capacity development partners:

- Learn-IT Consultants Ltd
- University of Dar-es-Salaam- Computing Centre (UCC)

Project partners:

- Business Care Services (BCS) - www.bistanzania.com
- Crop Marketing Bureau (CROMABU) - www.cromabul.com

Other:

- Ministry of Agriculture - www.tanzania.go.tz/government/agriculture.htm

Uganda

Knowledge exchange network:

- I-Network Uganda – www.i-network.or.ug

Monitoring and Evaluation partners:

- Mr. Chris Kasangaki, I-Network; Ms. Jannet Opio, Aclaim Africa Limited, Ms. Josephine Watuulo consultant

Capacity development partners:

- Uganda Institute of Information and Communications Technology (UICT) - www.uict.ac.ug
- TechnoBrain - www.technobrain.ws

Project partners:

- Ndere Troupe - www.ndere.com/arrin.about.php
- Uganda Commodity Exchange Limited (UCE) - www.uce.co.ug
- Uganda Industrial Research Institute (UIRI) - www.uiri.org
- Uganda Institute of Information and Communications Technology (UICT) - www.uict.ac.ug

Other:

- Ministry of Agriculture

Zambia

Knowledge exchange network:

- eBrain Forum – www.ebrainforum.org.zm

Monitoring and Evaluation partners:

- Travaillant Vers Une Economie Liberle Ltd, TEL consulting

Capacity development partners:

- ColdReed Training Ltd – www.coldtraining.com

Project partners:

- National Agriculture Information Service (NAIS), Ministry of Agriculture and Cooperatives, Zambia
- Organic Producers and Processors Association of Zambia (OPPAZ), Lusaka
- Zambia Chamber Of Small And Medium Business Associations, Lusaka
- Zambia Agriculture Research Institute (ZARI)

Other:

- Participatory Ecological Land Use Management Association (PELUM)
- Computer Society Zambia (CSZ)

Enabling partners (donors)

- Dutch Directorate-General for International Cooperation (DGIS) - www.minbuza.nl
- Ministry of Foreign Affairs Denmark (DANIDA) – www.um.dk
- Humanistic Institute for Development Cooperation (Hivos) – www.hivos.nl
- Catholic Organisation for Relief and Development Aid (Cordaid) – www.cordaid.nl
- UK Department for International Development (DFID) – www.dfid.gov.uk
- Oxfam – www.oxfam.org
- Swiss Agency for Development and Cooperation – www.deza.admin.ch