



THE TICBOLIVIA COUNTRY PROGRAMME

**The impact of IICD support for poverty reduction
and development using ICTs, 2000-2004**

Contents

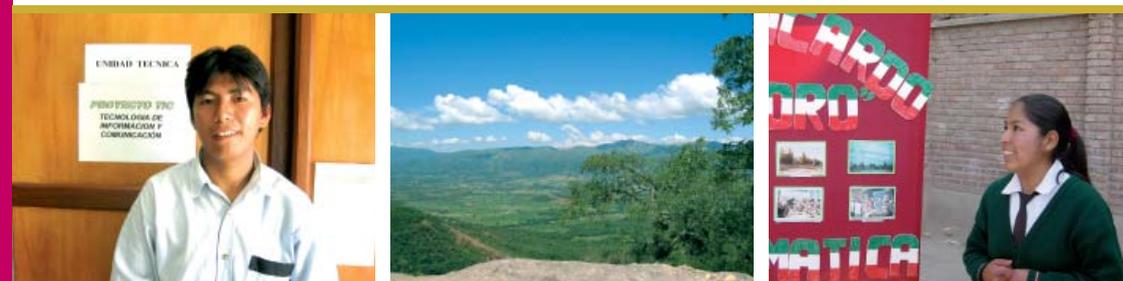
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1 Introduction

This booklet forms part of a series of studies¹ realised by the International Institute for Communication and Development (IICD), analysing the achievements and development impact of its programme of support in Bolivia. The Institute, which was founded in 1997 by the Netherlands Minister for Development Cooperation as an independent non-profit foundation, supports nine developing countries in their efforts to harness the potential of information and communication technologies (ICTs) for development purposes. IICD has Country Programmes in Burkina Faso, Bolivia, Ecuador, Ghana, Jamaica, Mali, Tanzania, Uganda and Zambia. The Bolivia Country Programme is one of two IICD Country Programmes in Latin America.

Each Country Programme helps local people develop ICT sector strategies, design and implement projects, and improve their ICT skills and knowledge. Country Programmes act as a catalyst, inspiring organisations in the country to develop new ICT activities independently based on what they have learned from working with IICD.

Since it was launched in 2000, the Bolivia Country Programme known as TICBolivia has helped over 50,000 people, mainly small farmers, teachers, students, indigenous leaders and local officials, use ICTs to improve their lives and contribute to their country's development. All the ICT activities generated under the Country Programme have been developed by and for local people, with support and guidance from IICD and its enabling partners. The strategy has been to give local organisations the tools they need to develop the skills, knowledge and communications infrastructure required to set up a critical mass of locally-owned, sustainable ICT projects and activities in a



¹ Other studies in the series include: The ICT Roundtable Process: Lessons learned from facilitating ICT-enabled development (2004). In preparation: ICTs in Education; Using ICTs to Create Livelihood Opportunities; and The Tanzania Country Programme (1998-2004).

specific sector such as education or good governance. Today, TICBolivia consists of fifteen projects, a training programme, networking activities, and monitoring and evaluation. The programme is active in three sectors: good governance, education and agricultural livelihoods. Among the participants in the programme are grassroots organisations, non-governmental organisations (NGOs), government bodies, and private companies. By the end of 2004, 86 information access points had been set up throughout the country, 4,400 individuals had been trained in the use of ICT, and a national ICT for development (ICT4D) information network called 'Red TICBolivia' was sharing knowledge, working on sector strategies, generating national visibility for the programme and raising awareness of the important role that ICTs play in the nation's development.

The findings reported in this booklet are based on a desk study carried out by two external consultants and interviews with IICD staff and Bolivian partners. Some of the most significant achievements in the use of ICTs in Latin America are highlighted here, in the hope that this experience will be useful to other countries and that successful approaches will be replicated and scaled up. To facilitate this, the booklet highlights the activities, outputs and impact of the Bolivia Country Programme, and provides lessons learned and recommendations that are particularly relevant for policymakers, donor agencies and implementing organisations.

This study evaluates the impact of TICBolivia from the perspective of indicators tied to the mission and goals of the programme, as well as the development objectives set out in Bolivia's Sector-wide programmes, the Poverty Reduction Strategy Paper (PRSP) for the country, and in a broader context, the United Nations Millennium Development Goals (MDGs). The impact of the programme on the specific goal of poverty alleviation is measured in terms of who is reached by the programme, and how the services provided have affected their level of awareness, empowerment, and economic options and status.

Material for analysis has been drawn from three sectors: agriculture, education and good governance, as well as from IICD's work with national stakeholders including the Bolivian government to develop ICT policies and strategies for the education and agricultural sectors and at the national level, respectively. Besides looking at the project and policy level, the overall impact of the programme on the three sectors is also described as much as possible in this study.

The Bolivian development context

Landlocked between Peru, Brazil, Paraguay, Chile and Argentina, Bolivia is the highest, and in some respects the most isolated country in Latin America. It is also one of the most culturally diverse. 80% of its 8.6 million inhabitants are descended from indigenous Amerindian peoples. Rich in natural resources such as natural gas, zinc and gold, Bolivia is the world's largest producer of tin. Yet despite ample cultural and natural assets, poverty is widespread; 70% of the population struggles to make a living. With the average annual income now standing at US \$1,030, Bolivia ranks as one of the poorest countries in the region.

The underlying causes of Bolivia's poverty are complex and rooted in the country's historical, economic, political and social history. Indigenous people are still effectively excluded from economic and political decision-making. This situation is further aggravated by weak and unresponsive public sector institutions that persistently fail to help the poorer segments of society, combined with the fact that the majority of the population has insufficient or no access to education, health care and other basic services. Finally, Bolivia has gone through 192 changes in government since it broke away from Spanish rule in 1825. This rapid turnover has meant that successive governments have little time to develop or implement long-term solutions to address poverty and inequality.

According to the 2002 Country Strategy of the United Kingdom Department for International Development (DFID)², two-thirds of Bolivians are poor, their basic needs unmet. This figure rises to 85% in the rural areas. Indigenous people are more likely to be among poor. The report also states that over 29% of the population (2.4 million people) live on less than US \$1 per day and over 51% (around 4.2 million) live on less than \$2.

Income inequality

The 2002 UNDP Human Development Report for Bolivia points out that recent economic growth has not brought significant benefits to the poor. Even though Bolivia is considered a middle-income country, it has the sixth highest level of income inequality in the world.³ Bolivia's Poverty Reduction Strategy Paper⁴ cites inequality

2 *Bolivia Country Strategy Paper*. Department for International Development, 2002. www.dfid.gov.uk/pubs/files/cspbolivia2002.pdf

3 *UNDP Human Development Report 2002*. United Nations Development Programme, 2002.

4 *Republic of Bolivia Poverty Reduction Strategy Paper – PRSP*. Republic of Bolivia, March 2001. www.imf.org/external/NP/prsp/2001/bol/01/Index.htm

and social exclusion along with poverty as the most severe obstacles to democracy and governance in the country, but the reverse is also true – poor governance is a factor in the continued entrenchment of poverty. Bolivia's political system, dominated by *elite* insiders, is viewed by many as a cause of the public sector's lack of responsiveness to poor people's needs.

Although successive governments have introduced various fiscal and monetary policies to stabilise the economy, the levels of export trade have not improved in the last twenty years. According to DFID, Bolivia depends heavily on external aid, which represents around 10% of the country's income and 50% of its total public investment.

Yet despite the challenges outlined above, there have been some important improvements in the last decade: life expectancy rose from 58 to 62 years and infant mortality fell from 75 to 58 per 1,000 live births. In addition, the percentage of the adult population to complete primary education increased from 38% to 51%.⁵

ICT and poverty

According to the 2003 World Bank Report *ICT and the MDGs: A World Bank Perspective*, areas in which ICTs can play a valuable role include:

- MDG 1 - Poverty alleviation: ICTs can be applied to enhance economic opportunities through increased market access, stronger negotiation powers and making production more transparent and efficient.
- MDG 2 - Education: ICTs can be deployed to enhance the quality of education and improve people's access to it.
- MDG 8 - Partnerships: Increased access to telecommunications can facilitate networking between organisations.

While it is often argued that compared to food, shelter and health, access to ICTs is not a primary development priority, this study does demonstrate that ICTs can indeed be powerful economic, social and political tools when placed in the hands of the poor. The acquisition of modern ICTs such as email, Internet, photocopiers and fax machines is by no means a panacea. Rather, the technologies are a means to an end. Used appropriately, they can help individuals and organisations to access, process and disseminate information quickly, effectively, and on an unprecedented scale. When the benefits of ICT are realised, they tend to have a catalytic effect, inspiring others to develop and apply the technologies within their own environments.

Improving infrastructure and telecommunications are mentioned as priorities in Bolivia's Poverty Reduction Strategy Paper (PRSP). The paper calls for public service infrastructure along with basic public services to be provided for the more vulnerable groups in society as an essential step in the poverty reduction project.

Objectives of the Bolivia Poverty Reduction Strategy

- 1 enhancing economic opportunities
- 2 enhancing human development and education
- 3 increasing security and social protection for the poor by protecting the most vulnerable segments of the population
- 4 promoting integration and social participation, which translates into issues related to indigenous identity, gender equality and sustainable development
- 5 increasing access to infrastructure and telecommunications

The strategy paper also recognises the key role of the informal economy for poor people's livelihoods and the importance of enhanced social inclusion and participation in political processes within a more transparent institutional framework.⁶ As this study will show, ICTs can play an important role in empowering, increasing social participation, and providing economic opportunities for marginalised groups such as small-scale farmers, through better access to markets, for example. The technologies can also help improve the quality and transparency of public services countrywide.

The Bolivian strategy stresses that human development is about addressing human capabilities, particularly through education. It is intended to increase people's social protection, to promote security and social protection, to encourage citizen participation and to create equal opportunities for vulnerable groups, especially indigenous groups and women. In all of these interrelated challenges, the ability of ICT to give a voice to the voiceless can play a key role. In education IICD's experience demonstrates that the technologies can be used effectively to enhance learning as well as to improve the effectiveness of the school system as a whole.

⁵ DFID 2002.

⁶ DFID 2002.

Country Programme TICBolivia

At the core of the Country Programme are the fifteen projects in three sectors carried out by organisations throughout the country. These implementing partners also collaborate with each other to share what they have learned and build an enabling environment for ICT in Bolivia, without which the projects could not succeed. The main forum for this sharing of experiences is a national network called *Red TICBolivia*, the TICBolivia network. Through the network the partners raise awareness about the relevance of ICT for the country's development; lobby ministries on the importance of considering ICT in their sector policies, and search for practical and affordable solutions to the issue of poor connectivity in rural areas. The partners often undertake evaluation and training together, enabling them to learn from each other's experiences.

Project formulation

To ensure that ICT projects developed within a Country Programme are linked to development objectives and that they reflect the needs and priorities of the local target groups, IICD first invites a broad range of local stakeholders from a specific sector to take part in an ICT Roundtable workshop.⁷ The Roundtable is an innovative, multi-stakeholder process developed by IICD at the end of the 1990s. It involves bringing key actors from a specific sector, such as education or governance, to the discussion table and inviting them to explore different areas within their sector that could be improved with ICTs. The participants are selected from a wide range of organisations working in the sector and include non-governmental organisations, civil society, and government. For many, this is the first time that they have discussed face-to-face the information and communication challenges facing their sector. Based on the Roundtable discussion the participants are then encouraged to come up with eight to ten project ideas.

IICD partners and projects in Bolivia

Red TICBolivia - www.ticbolivia.net

Coordinator: **Fundación Redes para el Desarrollo Sostenible – REDES**

Governance

- **Apoyo para el Indígenas-Campesino del Oriente de Bolivia – APCOB**
Red de TIC para el Pequeño Productor Indígena Chiquitano
- **CIPCA, Casa de la Mujer, ICO**
Red de Productores de Radios Locales 'Ondas Libres'
- **Confederación de Pueblos Indígenas de Bolivia – CIDOB**
Red de Información sobre Conflictos y Negociaciones de Tierras Comunitarias de los Indígenas de Bolivia

Education

- **Apoyo para el Campesino – Indígenas del Oriente Boliviano – APCOB**
Materiales Etnográficos en Sistemas Multimediático para la Educación
- **enbolivia.com** - Centro de Capacitación en TIC
- **Fundación Ayni Bolivia-Nederland** - Programa Ch@ski GTP en Bolivia
- **Ministerio de Educación** - Estrategias en nuevas técnicas de información y comunicación para el sector educación

Livelihoods

- **Asociación de Organizaciones Productoras Ecológicas de Bolivia – AOPEB**
Centro de Información Técnico Comercial del Sector Agro - ecológico de Bolivia
- **Centro de Promoción Agropecuaria Campesina – CEPAC** - Sistema de Información para la innovación tecnológica y competitiva de pequeños productores de la provincia Ichilo
- **Centro de Promoción Bolivia – CEPROBOL** - Sistema de Información y Asesoramiento en Comercialización para Productores Agrícolas
- **Coordinadora de Integración de Organizaciones Económicas Campesinas de Bolivia – CIOEC** - Sistema de Información para el Seguimiento de la Inversión Pública en el Sector Agrícola y oportunidades de comercialización de las OECAs
- **Fundación Acción Cultural Loyola – ACLO Chuquisaca** - Sistema de Información Campesina – Indígena
- **Fundación AGRECOL Andes** - TIC para documentación e intercambio de experiencias en agricultura ecológica campesina
- **Instituto de Capacitación del Oriente** - Sistema de Información y Monitoreo Agrícola en los Valles Cruceños
- **Ministerio de Asuntos Campesinos y Agropecuarios – MACA** - Política y Estrategia para Implementar TIC para el Sector Agropecuario

⁷ For more information, see *The ICT Roundtable Process: Lessons learned from facilitating ICT-enabled development* (IICD 2004).

Roundtable workshops were convened in Bolivia in 2000 and 2002, giving rise to the existing projects in three sectors. The projects' primary goal is of course direct poverty alleviation and development among the target groups, but they also generate useful experiences and lessons learned. The process of measuring the impact of the projects on end users also contributes to our understanding of the relationship between ICTs and the attainment of development objectives.

Red TICBolivia

Red TICBolivia is a network for all those interested in ICT-enabled development in Bolivia. Established in 2001, the network brings together Bolivian ICT practitioners, policy-makers, and representatives from the international donor community in Bolivia. The core membership consists of the organisations participating in the IICD Country Programme, but others are also involved. The network provides a forum for them to exchange experiences about ICT initiatives in Bolivia, particularly with regard to lessons learned and the impact of ICTs on the ground. The network also fulfils a number of other roles such as: stimulating collaboration between IICD's partner organisations in Bolivia; publishing lessons learned from ICT-enabled development through a publications series and via its website; and stimulating public debate on ICT issues through online discussions and seminars.

Policy participation

With its overall perspective of ICT4D issues in the country, Red TICBolivia seeks to engage policymakers and is currently helping the Bolivian government to draft a National ICT Policy, together with the Vice-Presidency, the national telecommunications regulator SITTEL and UNDP. As the only body currently working with ICTs in a development context in Bolivia, Red TICBolivia brings a pro-poor perspective to the national ICT debate. It contributes experiences, assists in the facilitation of workshops to identify critical needs, and influences the poverty-related orientation of the Bolivian government's national ICT policy in terms of target group needs, the PRSP and the MDGs.

Embedding

'Embedding' is a strategy followed by IICD to ensure long-term sustainability and impact of its projects. Although many of them start out as stand-alone pilot projects, if they are successful and are delivering valued services the goal is to embed them within the sector. For example, projects may be embedded within the core programme of the implementing organisation or into a higher level sector programme carried out by the government. TICBolivia partners have developed a strong working relationship with the Ministry of Education and the Ministry of Agriculture and are now working towards embedding and up-scaling TICBolivia projects, or the approaches and priorities that have emerged from them. Through active participation in policy processes, dialogue with ministries, and efforts to embed and upscale projects, TICBolivia can better align its work with the Sector Wide Approaches, the country's PRSP, and ultimately with the Millennium Development Goals.



PRSP Objective	TICBolivia projects and sector strategy processes	Project Objectives
Enhance economic opportunities	7 projects and a sector strategy process in the Livelihoods sector	<ul style="list-style-type: none"> • Increase market access • Strengthen negotiation power • Improve production efficiency
Enhance quality of and access to education	3 projects and a sector strategy process in the Education sector	<ul style="list-style-type: none"> • Enhance teaching methods • Strengthen curriculum • Improve institutional capacity
Empowerment of citizens	3 projects in the Good Governance sector	<ul style="list-style-type: none"> • Enhance citizens' ability to demand their rights • Increase social participation

2 Impact on agriculture and rural development

Rural poverty in Bolivia is inextricably linked to the low development of the agricultural sector. This is a serious challenge for Bolivia's government as agricultural production is the mainstay of the Bolivian economy, accounting for 18% of the Gross National Product and 45% of the active economic population. The Bolivia PRSP identifies priority areas to address rural poverty as production infrastructure and access to telecommunications⁸, as well as access to land, competitiveness and diversifying non-agricultural employment.

The majority of Bolivia's poor live in rural and remote areas and have livelihoods that are closely linked to smallholder agriculture. The low productivity of the farm sector and the low prices that farm products command in the marketplace are central concerns for them. The use of small-scale production techniques, unskilled labour, water shortages, the lack of any basic production infrastructure, and the high cost of capital all have a negative effect on productivity⁹.

Being poor often means having insufficient access to food and other assets such as public services, electricity, information, etc. The rural poor are also politically marginalised and isolated. They do not have access to credit, water and inputs (seeds and fertiliser) and they often lack secure land rights. Yet although they lack access to technology, information and tools, they are not isolated from the economic ups and downs. In fact, they are more vulnerable to market fluctuations than most people as they depend on the markets for their survival. Lack of access to price information results in high transaction costs and farmers who have little room to negotiate in selling their products to middlemen.

The report from the IICD Roundtable workshop for the agriculture sector in 2002 identified three main obstacles that stand in the way of agricultural products being successfully commercialised: lack of infrastructure (roads, storage facilities, electricity); inefficient post-harvest handling and distribution; and a lack of information. Small-scale farmers operate at the tail end of a long chain of intermediaries where the relationship between the small producers and the buyers is uneven. In Bolivia farmers 'sell low and buy high'.

ICT projects in the Bolivia Country Programme seek to close the information gaps that hold back the sector and that handicap rural communities dependent on small-scale

agriculture. Access to information, as well as the dissemination of information make it possible to enhance economic opportunities through: *increased market access; improved negotiating powers; and better production methods.*

Results

There are eight agriculture projects in the TICBolivia Country Programme. The projects are providing access to ICT and agricultural information through 42 information points serving 226 small and medium-sized producer organisations. In addition to these rural projects, TICBolivia is also helping the Ministry of Agriculture to develop and implement an ICT strategy for the agriculture sector. The strategy will help to coordinate the flow of agricultural information to and from farmers.

Organisation	Project	Internet access points	Direct users	Indirect users
ACLO	Market information system	5	760	50,000
AGRECOL	Farmer-to-farmer	1	425	-
AOPEB	Ecological export promotion	14	210	12,000
CIOEC	Public investment	8	145	825
CEPAC	Production information system	5	630	9,224
CEPROBOL	Export promotion	3	720	7,450
ICO	Market information system	5	750	60,000
Ministry of Agriculture	Sector ICT strategy	1	140	-
Total		42	3,780	139,499

Source: Based on data from implementing organisations 2000-2004

To date, the projects have provided ICT and technical training to over 1,250 people. 3,780 small-scale producers participate actively in the projects and use the full information service package offered by the project. This is encouraging, as several projects have only been operating one or two years, and the projects have reached 60% of their collective five-year target of 6,700 people. Meanwhile, another 140,000 producers are benefiting indirectly from the projects; this includes the small agricultural producers who visit the information centres to use the computers or the internet there or who listen to the radio programmes on agricultural issues that are aired through the projects.

⁸ Bolivia Poverty Reduction Strategy Paper, Summary, 2001.

⁹ Bolivia Poverty Reduction Strategy Paper, 2001.

End users

IICD refers to the people who access the project services directly as 'end users.' The profile of end users of the projects is based on questionnaires submitted by a sample of 250 members of the target groups in 2003 and 2004. *The disparity between male and female participation in the projects indicates that greater attention needs to be paid to the issue of gender.*

End users of agriculture projects in Bolivia, 2002-2004¹⁰

Male 74% - Female 26%

Rural 81%

Below secondary education 70%

Below average income 95%

Satisfaction and awareness

Using the same questionnaire method, end users reported high levels of satisfaction with the services provided by the projects. 89% felt that they had achieved their goal and were satisfied with the project. Only a small number of people mentioned the use of new technologies as their main reason for taking part in a project.

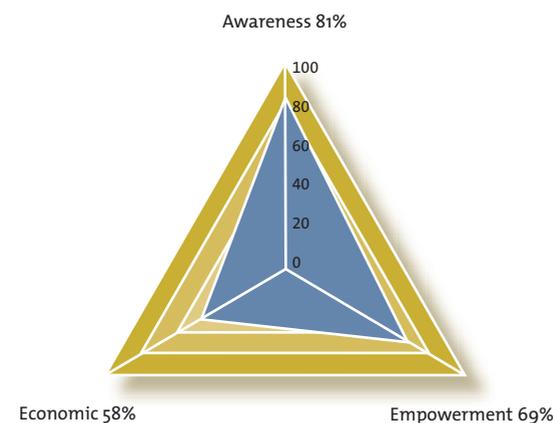
'Now I know the market prices, where to sell and in which period. Before I used to sell products very cheaply when there was much supply and limited demand, afraid that the products would perish,' said one farmer interviewed by questionnaire.

Impact

IICD has identified three indicators by which it measures the impact of projects on end users in the agriculture sector: *awareness, empowerment and economic impact.* During the course of the three-year period in which the projects have been implemented, the overall impact has been high in terms of awareness (81%) and empowerment (69%). *58% of the respondents indicated that they experienced a direct positive economic impact.*

Analysing the economic impact in more detail, the participants considered the strongest impact to be derived from better access to market price information which improved their negotiating position. A smaller group indicated that they had benefited from having access to information on how to increase the efficiency of their production methods.

Impact of agriculture projects 2002-2004



Recommendations

In their response to questionnaires end users made several specific recommendations to improve the projects:

- More access to existing information centres and more new information centres.
- More and regular access to equipment, training opportunities and external technical assistance.
- Lower costs and higher capacity with respect to internet connectivity, which remains a bottleneck considering the current high costs and limited capacity.

Cases

The IICD-supported projects in the agriculture sector aim to enhance the income opportunities of farmers by: increasing access to markets and up to date market price information; improving the farmers' negotiation position; promoting more efficient production methods; and lowering the input price. How these projects contribute to these objectives is described below.

¹⁰ Information gathered from 250 end user questionnaires over two years as part of regular IICD Monitoring & Evaluation of the projects.

Increasing farmers' access to markets

Three of the projects aim to improve access to agricultural markets:

- 'Commercial Information and Advisory System for Agriculture Producers' by CEPROBOL, a government organisation;
- 'Technical-Commercial Information Centres for the Agro-Ecological Sector in Bolivia' run by AOPEB, a grassroots organisation;
- 'Information System on Public Investment for Small Producers in Agriculture' by the grassroots organisation CIOEC.

The sustainability of all three projects is pretty much assured as they have been embedded by policymakers at the sector level and are owned and run independently by local organisations, with IICD acting in a facilitating and guiding role.

Commercial Information and Advisory System for Agriculture Producers

This project is run by the Bolivian Export Promotion Centre CEPROBOL,¹¹ a decentralised government organisation attached to the Ministry of Foreign Affairs that provides information services to large exporters and agro-processing industries. With IICD support CEPROBOL has developed a series of information services to help exporters and potential exporters access foreign markets. Alongside printed brochures and research publications, an online database accessible via CEPROBOL's website www.ceprobol.gov.bo provides data on the conditions for entering export markets as well as contact information on potential buyers of organic products in the USA and Europe. CEPROBOL has a team of experts at the central office in La Paz and in regional offices in Cochabamba and Santa Cruz who provide information by email to potential exporters.

CEPROBOL recently launched an e-commerce platform that facilitates the direct sale of products via the internet. Still in its first phase, the platform allows companies and producer associations to open a virtual shop supported by a credit card, check and cash payment system and a delivery system operated by delivery companies DHL and EMS. The platform mainly serves small firms and at this moment hosts around 30 such companies.

Although the project has been successful in reaching larger export companies, it is still a challenge to reach small and medium-sized companies and farmer associations. To address this, the organisation is in the process of strengthening the regional offices by upgrading ICT facilities and training regional staff.

Collaboration with the many NGOs and farmers' associations participating in TICBolivia has helped CEPROBOL reach out to smaller producers. CEPAC, CIOEC and AOPEB are now acting as intermediaries to direct small-scale producers to the export services provided by CEPROBOL.

Technical-Commercial Information Centres for the Agro-Ecological Sector

This project was developed in 2001 by the Association of Organisations of Ecological Producers of Bolivia (AOPEB) with support from IICD and the Dutch NGO HIVOS. The aim is to use ICT to create marketing opportunities for ecological products. AOPEB has 51 member organisations including producer organisations and small and medium-sized enterprises (SMEs). The affiliates represent 30,000 producers from the lowlands – mainly indigenous Mosestenes, Tsimanés, Lecos, and Tacanas – and Quechas and Aymaras in the Andean region. 41 member organisations are participating in the project with 700 producers now making regular use of the information and fully trained in the use of information for market purposes.

The project is responding to the growing international demand for organic products. To meet this demand, farmers need to access information on issues such as: the strict criteria that these products should meet in terms of quality control and certification; increased expectations among consumers; and, the growing demand for production information by international and national trading companies.

At the operational level, AOPEB maintains a database-driven website that provides information on production methods, export standards, and the certification of ecological products. Buyers can find monthly updated information on the volume of sales and quality of key products such as cacao, coffee, nuts, tropical fruits and quinoa that are offered by producer organisations affiliated with AOPEB.



¹¹ CEPROBOL target groups include 220 export companies, 650 potential exporters and 360 larger producers, as well as over 10,000 small-sale producers.

The farmers' organisations gain access to the information through 14 regional information centres serving the key producing regions in Bolivia. The centres are owned by the local producer associations and provide access to two to five personal computers, information via email, internet and training. AOPEB organised an intensive training programme for the project team, coordinators of the centres, and representatives of farmers associations.

AOPEB has boosted the efficiency and effectiveness of communication with existing buyers in Europe and the United States and has been able to identify several new buyers for the member organisations. AOPEB members also benefit from other services such as e-newsletters, bulletins and forums to promote the production, transformation, commercialisation and large-scale consumption of Bolivian ecological products. In addition, throughout the project, AOPEB has successfully lobbied for laws and regulations to promote ecological products in Bolivia.

However, evaluation results for this project indicate that even more farmers should be drawn into the project and encouraged to take more ownership of the centres and the project as a whole. At the level of the information centres, there are two problems: staffing of the centre and the problem of achieving financial sustainability. Currently the revenue generated from a percentage of successful export deals is too small to sustain the centres. These two issues and some possible solutions are discussed later in this report in the chapter on community information centres.

Information System on Public Investment for Small Producers in Agriculture

Another way to improve market opportunities for small farmers is to provide them with access to information on public investment programmes. The Coordinator for the Integration of Peasant Organisations in Bolivia (CIOEC) has been particularly active in this field. As the main institution representing 600 peasant organisations and rural economy organisations in Bolivia (OECAs), CIOEC's goal is to improve the social, economic, and institutional conditions of these organisations, which are important actors in Bolivia's socio-economic development.

As a result of the government's decentralisation process, the possibilities for local producers to participate in public bids for agricultural products have increased enormously. The bidding is organised on a large scale by the government but can also be solicited by local governments. However, the sector faces several problems such as the lack of access to information, low participation, and poor monitoring and coordination. In rural areas in particular, information on new bids arrives late or

not at all due to the lack of communication mechanisms and even if it does arrive, it is often not understood by the smaller producer organisations. Consequently, rural organisations have not been able to participate effectively in public bids. The CIOEC project is helping to change this by providing the information that is needed and is currently guiding 55 organisations through the submission process. Its office in La Paz researches potential bids for member associations and then informs the organisations nationwide on the conditions for bids via email through eight regional centres located in the Bolivia's key production areas.

So far, 166 representatives from CIOEC's member organisations have received training in ICT skills such as word processing and spreadsheets. With these instruments, they are now able to prepare project proposals and bidding documents. Most of CIOEC's members are very poor farmers who have not been exposed to either a computer or the internet. CIOEC has therefore developed very basic instruction materials and hands-on training courses based on modules developed by TICBolivia.

CIOEC affiliates have so far won a public tender allowing them to deliver milk to public hospitals and schools and another public tender to deliver quinoa to schools for children's breakfasts. This resulted in widespread interest in using ICTs to support access to markets. Still, recent meetings with affiliates indicated that smaller organisations such as artisans still lack the technical and organisational skills to participate successfully. CIOEC is now looking for ways to expand and intensify training targeting the less organised member organisations.

The project also focuses on lobbying. Most of CIOEC's member organisations produce goods for the Bolivian market as they are not capable – either in terms of quality or quantity – to compete in export markets. CIOEC promotes the concept of 'Compra en Bolivia' which encourages Bolivians to buy their own home-grown products.

The question of who should be responsible for running the centres has also led to some bottlenecks. Unlike AOPEB, which contracted a paid administrator, CIOEC's centres are managed on a voluntary basis by members of its regional chapters. Although this undoubtedly has a positive impact on the sense of ownership among CIOEC's affiliates, on a practical level it means that the centres are not staffed regularly because members are often away tending to their day-to-day farming responsibilities. One solution suggested involved placing young farmers from the community in charge of each centre's operational activities.

Improving farmers' negotiation power

IICD supports a number of initiatives geared towards improving small farmers' ability to negotiate in the marketplace. This usually involves finding ways to provide the farmers with timely access to reliable information on market prices as well as production inputs. The three IICD-supported projects in this area are all regionally based and each one disseminates information about product prices and input via the radio and the internet.

Agriculture Information and Monitoring Systems in the Valleys of Santa Cruz

This is one of the most successful projects to date in the use of ICT in agriculture. Initiated in 2001 by the Institute for Capacity Development in the Eastern Region of Bolivia (ICO) in collaboration with the producer organisation of Vallegrande (CAPA), the project won an award in the ICT Story contest which was presented at the World Summit on the Information Society (WSIS) in Geneva, Switzerland in 2003. The project is being implemented in the area of the valleys in the department of Santa Cruz de la Sierra. So far, it has set up five regional information centres equipped with computers and internet access. Each centre develops a database registering the volume of farming goods that have been produced as well as market prices at the community level. This allows producers to understand and compare price developments and production patterns in the region.

Until this information was available, small farmers in the region found themselves at a disadvantage when they came to sell their produce. The issue was not one of a lack of demand for their produce - the region produces 70% of the vegetables consumed in the



city of Santa Cruz - but rather the ability to secure a fair price for their produce from the middlemen who sold the goods on their behalf. Farmers in the region depend on middlemen and brokers to sell their products for them and then pay them for what has been sold. The middlemen collect the products straight from the farms and take them to the market in Santa Cruz without paying upfront to the producers. Once the products are sold, the middlemen go back to the farms and pay a small amount to the producers. Unable to establish what price their products actually sold for that day, the producers have no other choice than to take the middlemen's information on trust and accept that the price stated is the actual price for which their goods were sold.

ICO collects prices in the Santa Cruz market and then sends them directly to the regional office in Vallegrande. There the price information is aired twice a day on a radio programme called 'The Farmer's mail'. The programme is the best received programme in the region reaching 60,000 producers. The farmers have indicated that, thanks to the information supplied through the project, they can now stand up to the middleman and negotiate better prices.

Apart from providing useful information on market prices, the project also informs farmers on other important matters. For example, farmers regularly call into the radio programme to discuss issues such as innovative production methods, regional autonomy, and environmental development. Additional information is also collected from the internet through the website www.ondaslibres.org.

Information system on technical innovation and competitiveness for small-scale producers in Ichilo Province

Similar to ICO, the Centro de Promoción Agropecuaria Campesina (CEPAC) provides marketing and production information in order to improve the productivity, competitiveness and negotiating position of small farmers' organisations in the region of Ichilo. This ICT project was launched in 2002 to enhance the economic position of these organisations in the region as part of a support programme run by the Dutch NGO CORDAID.

Like ICO, CEPAC has helped to set up five local information centres and rural radio programmes through the project. These centres provide farmers with market information and market training (on topics such as prices in different markets, transport, quality rules and certification, customer preferences and volume) and ICT training. In addition, CEPAC has helped to build a knowledge database in each of the information centres, focusing on the particular types of products that are relevant to the farming communities that live close to the information centres.

CEPAC's approach is unique: it involves getting the municipal government to assign their extension officers to the project to manage the information centres. This way the centres are more sustainable and are run by experienced staff members. Although this approach has been successful in two of the centres, in other cases the assistance provided by local government has not run smoothly. Firstly, local government officers have many other duties and responsibilities that inevitably distract them from the information centres. Secondly, their involvement requires intensive awareness creation sessions and negotiations with often politically unstable local governments.

CEPAC's experience has revealed that it is difficult to assess the information needs and priorities of the farming community. It was found that this is only possible through regular evaluation meetings with the stakeholders to make adjustments to the type of information distributed and collected and the form in which the information is presented. One result of these meetings is that the radio programmes and custom-made advice in the information centres are often a more effective means of communication than paper-based studies and brochures.

Marketing Information System in Chuquisaca (ACLO)

A project to develop a Marketing Information System in Chuquisaca was set up by Acción Cultural Loyola (ACLO), a local NGO that provides small farmers' associations in the very poor region of Chuquisaca¹³ with assistance in commercialisation, production and capacity building. Launched in 2003, the project set out to inform producers about the principal regional market in Sucre and the production and sale of special products such as dried pepper and api, a local corn-like product. This project forms part of a wider access-to-markets programme which is also supported by the Dutch NGO CORDAID. By providing market information, ACLO has helped small farmers to make better decisions and improve their negotiating position. The project is a good example of how effective a combination of traditional and modern ICTs can be. ACLO's radio station has been a powerful means of communication for over twenty years, reaching 50,000 farmer families in the region. It is now also used to distribute price information. As information alone is not enough to enhance farmers' negotiating skills, five producer associations¹⁴ representing almost 800 farmer families were given intensive training to enhance their ICT and marketing skills. The associations are located in very remote rural areas and communicate with ACLO via email. Their offices are linked to the internet via satellite, and they use ham radio to link up with communities outside

the main villages. The change from working with more traditional ICTs such as radio to modern ICTs such as the internet requires time, extensive awareness-building and technical training. Introducing ICTs in remote, rural areas has been a major challenge for ACLO, particularly concerning the introduction of the satellite internet connections. Yet, the organisation has successfully set-up cost-shared satellite facilities with the municipal government and schools. In addition, to increase the potential for financial sustainability, the information centres also provide telecentre services.

Promoting more efficient production methods

ICT can also help to improve productivity and efficiency by facilitating knowledge exchange on sustainable production technologies and practices, especially sustainable agricultural practices, between groups of farmers.

Documenting and exchanging experiences in organic agriculture

A project developed by Fundación AGRECOL Andes in 2003 uses ICT to help farmers exchange their experiences in ecological agriculture. The idea is to improve sustainable and ecological practices and enhance the income opportunities of small farmers. It works throughout Bolivia with 125 interested farmer organisations representing 1,800 producers, 24 municipalities, NGOs, institutes and universities. The project identifies and systematises sustainable and innovative practices in agriculture using multimedia. To date, 21 successful ecological practices have been identified and processed by the project team in collaboration with the farmers, applying new ICT methods such as PowerPoint presentations with multimedia elements such as audio, video and digital cameras.

The materials are used during exchange visits between farmers throughout Bolivia. In addition, the multimedia materials are stored in a database-driven website which is accessible to other farmer groups, interested NGOs and private institutions (www.agrecolandes.org).

¹³ Chuquisaca is located in the South and is considered to be one of the poorest regions in the country.

¹⁴ APFAN (El Villar); APA y APAMA (Alcalá), APROCOMI (Sopachuy) and APROAFA (Presto).

3 Impact on education

Bolivia's state education system offers very little access to ICTs and primary and secondary education within the country is generally poor, despite reforms. Tertiary education is of a higher quality but unreachable for the majority of the population. The majority of Bolivia's young people live in extreme poverty, especially in rural areas where there is little access to education. Even today, the educational system only covers 58% of the Bolivian territory.

As a result, many of Bolivia's farmers, indigenous peoples, and women are illiterate. More than 50% of the population aged between 14 and 17 years old are excluded from the educational system. Out of every 100 children who attend primary school, only 56 will go on to secondary school and 22% will have access to higher education. Many children drop out of school due to a lack of education facilities or because their parents can't afford to send them or spare them from household or agricultural duties.

This situation is exacerbated by Bolivia's outdated national curriculum which has its origins in the Educational Reform Act of 1975. Some schools have taken the initiative and have updated their own school curriculum; however, the lessons taught in schools are still not relevant to the needs of the students as they are not in line with the requirements of the labour market. Not only do schools need a stronger infrastructure, they also need adequate resources and training to improve the human capabilities of primary and secondary school teachers. In response to this, Bolivia's PRSP aims to strengthen the productive capacities of the poor by improving both the overall quality of, and access to, education.

At the international level, the 2003 World Summit on the Information Society (WSIS) also paid explicit attention to ICT as an important instrument for enhancing the quality of and access to education by means of connecting local and central government departments, to adapt all primary and secondary school curricula to meet the challenges of the information society (Plan of Action, World Summit on the Information Society (WSIS), Geneva, Switzerland, 2003).

ICTs can improve the quality of education and young people's access to it in several ways:

- Enhancing and updating teaching methods, for example by transforming the curriculum using ICT applications such as videos, CD ROMs and the internet to develop (interactive) educational materials for use in different subjects, and
- Strengthening the institutional capacity of educational authorities, particularly with regard to the government body responsible for education, schools' administration systems, and teacher training institutes.

Results

In Bolivia, an ICT strategy and two projects are being developed for the education sector with support and guidance from IICD. The projects provide access to ICTs through 25 computer labs that currently serve 47 primary and secondary schools. So far, 1,575 teachers and students have been trained in ICT and are participating in the content programmes provided by the projects. Meanwhile, an additional 20,000 teachers and students can be viewed as indirect beneficiaries of the projects as they also use the ICT facilities (computers, internet). Apart from the projects, a nationwide ICT strategy and implementation programme is also being developed with the Ministry of Education, involving 400 public functionaries. This will expand the two projects and support a wider introduction of ICTs in the various fields of education from 2005.

Organisation	Project	Internet access points	Direct users	Indirect users
APCOB	Multimedia ethnographic material (Santa Cruz)	6	275	3,500
AYNI	Chasqui Global Teenager Project (Oruro)	21	1,300	16,500
Ministry of Education	ICT strategy for the education sector	1	400	-
Total		28	1,975	20,000



End users were identified on the basis of a representative sample of 115 people interviewed by questionnaire in 2003 and 2004 that included teachers and technical staff of schools (25%) and students participating in the projects (75%). The projects are reaching more women and girls and almost all the users indicated that their income levels were below average (many of them are students) and that they had only received primary or secondary education. The projects are currently operating in provincial towns and district centres. When the education programmes are expanded, *greater effort should be made to target rural schools*, in line with the PRSP's commitment to address the low quality of education in the rural areas and their limited access to educational facilities.

End users of education projects in Bolivia, 2003-2004¹⁵

- Male 38% - Female 62%
- Rural 5%
- Below secondary education 80%
- Below average income 98%

Satisfaction and awareness

Measured over the period 2003 and 2004, an average of 96% of teachers and students indicated that the project had managed to achieve its objectives in that it had increased the overall interest in improving the teaching processes and learning environment and had made classes more interactive and creative. The main reasons given for participating in the project were that it broadened the participants' horizons and knowledge about other cultures; improved the quality of education offered; and improved their ICT skills.

Too often, one of the main stumbling blocks when introducing ICTs into a new environment is trying to convince people that the technology on its own will not make a difference; rather it is the way in which it is applied and the goal it is aiming for that will make a difference. It is therefore a promising sign that the majority of the participants in this project realised early on that the computer was merely a means to an end and not an end in itself.

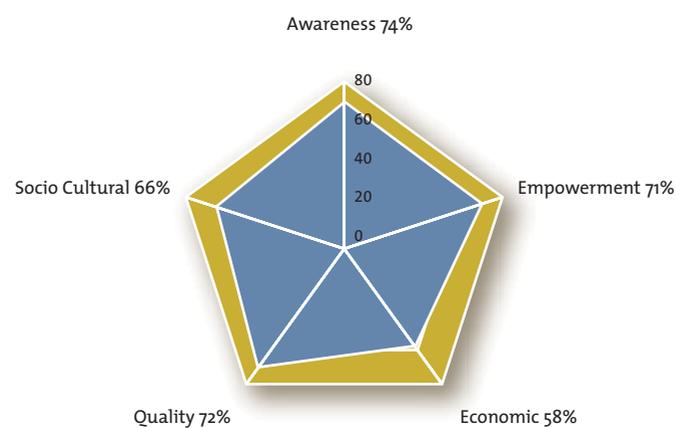
Impact

In addition to awareness, empowerment, and economic impact, IICD has identified two additional indicators by which it measures the impact of projects on end users specifically in the education sector: *quality of education and socio-cultural impact*.

'We can incorporate ICT to enhance the application of the curriculum, thereby improving the quality of education,' said one of the teachers interviewed by questionnaire.

Almost 75% of the participants registered high levels of overall impact in terms of raised awareness and empowerment. In terms of economic impact, the majority of the teachers and students felt that they had acquired new skills and that their market value had been improved as a result. The quality of education, that is the quality of the educational materials used and the lessons, also improved according to 72% of the teachers and students taking part. 66% of the users reported experiencing a considerable socio-cultural impact in terms of having their horizons broadened and an increased involvement in decision-making processes within the school.

Impact education projects 2003-2004



¹⁵ Information gathered from 115 end user questionnaires over two years as part of regular IICD Monitoring & Evaluation of the projects.

Recommendations by end users

To enhance the level of satisfaction among end users and boost the overall impact of future projects, users identified a number of areas in which projects could be improved:

- The teachers were critical about the quality and relevance of the content provided through the projects and about the training methodology that was applied. To address this issue it is important to *involve teachers more closely in the selection of content areas*.
- Continuity in ICT support is necessary to ensure the sustainable integration of ICT in the curriculum.
- Respondents identified a need for additional investments in equipment to allow more equal access to ICT for all students.
- End users requested assistance to help them raise awareness and lobby for ICT programmes among local and national governments.

Cases

Chasqui Oruro Global Teenager Project in Bolivia

In 1999, the AYNi Foundation launched the Bolivian chapter of the Global Teenager Project, an international project that enables secondary school students and their teachers from over 35 countries to meet up with each other online and take part in regular virtual discussions (called 'learning circles') via email and internet. The Bolivian chapter, known as the *Chasqui Oruro Global Teenager Project in Bolivia*, set out to provide equipment, training and educational content programmes to disadvantaged schools in Oruro province, one of the poorest regions in the Bolivian highlands.

Based on the premise that young people's opportunities can be improved through education, the project focuses on schools in Oruro, a region blighted by high rates of illiteracy, widespread unemployment and poverty, and regular migrations of young people to the cities. The Chasqui Oruro Global Teenager project gives schoolchildren in the region access to ICTs and teaches them about the many different ways in which ICTs can be used, such as communication, accessing information, and writing up their own reports on the computer. It is an innovative, easy and affordable way to develop the human capabilities of Bolivia's school children. When set against the outdated curricula currently being used in schools, which are based on the Educational Reform Act of 1975, the project is opening up teachers and students alike to a more interactive approach to learning; one that allows pupils to explore their own capabilities and potentials.

The project provides equipment to 47 schools in the suburban and rural areas around Oruro. The equipment is used by teachers and pupils at primary and secondary levels during morning, afternoon and evening classes; the later sessions are open to children from the poor families. This way, different groups of children have access to the computer facilities. The project introduced free Linux software as the main software to support the computer networks in the schools. The software also serves as the front-office package and has radically increased the stability of the networks and reduced the cost of the project.

Computer teachers, who are also in charge of the computer labs, are trained to set up and maintain the networks. They are also responsible for giving basic ICT training to other teachers in the school. Subject teachers are also trained to use ICTs in classroom teaching and are shown how to develop their own methodologies and ICT-based support materials in subjects such as mathematics and reading. In addition, a number of interactive modules to support various subjects have also been developed and are being applied by the teachers to enhance the curriculum in these areas. The pupils participate in the IICD-supported international 'learning circles' which are geared towards increasing their understanding of other cultures through lively, global classroom debates in a virtual environment. Every year, 3000 pupils from 95 secondary schools in 22 different countries take part in these international exchanges of knowledge and experiences. As a result, more than 1,300 teachers and students have now been trained in the use of ICT and ICT-based learning methods while an additional 16,500 teachers and students have access to the equipment.



One of the key components of the project involves setting up administrative committees to manage the programme and ensure that it is financially sustainable. The committees consist of the headmaster, members of the parents' committee, teachers and students. Small monthly fees paid by the parents pay for the computer teacher's salary, connectivity, maintenance and operational expenses, making the programme fully self-sustaining. In many schools the committee has been able to find sponsors to pay for additional computers. This way, the costs of AYNi are limited to overall project management, content development, and monitoring the project's progress.

Teachers and students alike have broadened their horizons through the project and many of them feel less isolated now that they have better access to useful and relevant information. Being able to handle a computer and send emails to their peers all over the world makes them feel that they have achieved something positive and gives them a new-found confidence.

To ensure the future sustainability and expansion of the project, AYNi signed an agreement with the Education Regional Office of Oruro which actively participates in the implementation of this project. AYNi and the regional office then signed a joint agreement with the Ministry of Education to formalise the project as part of the formal education programme offered in Oruro.

Furthermore, the project has been proposed as a model for the introduction of a national ICT programme in primary and secondary schools. AYNi is now seeking funding for this proposal among donor agencies and the Ministry of Education (see also Chapter 5).

Multimedia Systems for Ethnographic Materials

One of the themes of Bolivia's education policy today is the need to acknowledge the multi-cultural nature of the Bolivian population. The Educational Reform programme initiated in the 1980s included multi-cultural education as one of its principal components. Yet despite this, there were no materials available to support learning and teaching in basic subjects such as history, geography, languages and culture before this project started.

To respond to this gap, APCOB has developed school materials on indigenous culture and practices using modern and interactive multimedia applications. The materials enrich classes in different subjects such as history, geography, culture and languages. APCOB is using ICTs (videos, CD ROMs, audio, images) to produce multi-media CD ROMs for primary and secondary education. The experience to date in five schools indicates that both teachers and pupils easily engage with the highly interactive nature of the materials as they represent a much more interesting and entertaining way of presenting ethnographic knowledge than the traditional textbooks.

To ensure the project's sustainability, APCOB and the regional educational office of the Ministry of Education signed an agreement to formalise the introduction of the CD ROMs as support materials for the national curriculum. The project is also working with the Ministry of Education at the national level to integrate the materials in the government's sector policy for education. Meanwhile, the project has received both national and international acclaim: in 2004, it was formally recognised by the Minister of Education in Bolivia and won an international award from the Inter-American Development Bank. It was also one of the finalists in a competition organised by UNESCO.

4 Impact on governance

Democracy was re-established in Bolivia in 1982 and three years later structural adjustment was initiated. Bolivians today, particularly the rural poor, are still marginalised and unable to influence government policies and programmes. Problems such as social exclusion, inequality and poverty persist. The three main challenges that Bolivia's government is trying to address in the governance sector today are: strengthening public sector institutions, making the political system more transparent and accountable and ensuring that basic services are delivered effectively and efficiently to the majority of Bolivia's citizens, particularly vulnerable groups such as indigenous people and women.

The Bolivian PRSP clearly addresses issues related to increased integration and social participation by supporting and providing training to civic organisations and by encouraging citizen participation; by reducing inequalities and barriers based on ethnic discrimination by providing marginalised groups, particularly indigenous communities, with training to enable them to benefit from and use natural resources; and by improving existing schemes designed to boost increasing civil participation. Empowering citizens to demand their rights, increasing social participation, and opposing social exclusion are seen as the first crucial steps towards reducing poverty.

ICT can facilitate the process of political participation and improve the social inclusion of isolated and vulnerable groups. ICT applications such as radio, telephone, email and the internet can be of great value in bringing people together, bridging geographic distances, and providing relevant information to isolated groups. In this sense, access to information can enable people to protect their own interests and address their needs.

These issues will be addressed in this chapter by evaluating the extent to which IICD-supported projects in the good governance sector are:

- Empowering citizens to demand their rights;
- Increasing civil participation in the decision-making processes;
- Boosting the self-confidence of the poor and other marginalised groups;
- Enhancing the quality and transparency of government information.

Results

In Bolivia, four projects are being implemented in the good governance sector. Although exact data are difficult to provide it is estimated that around 6,185 people are actively participating in the projects. One of them, the radio programme Ondas Libres, has 5,000 frequent visitors to its website. Over 82,000 people have consulted CEBEM's information services which are provided through its website. As web-based user numbers are difficult to track, the active number of subscribers may be lower than listed.

Indirectly, the projects are helping to raise the awareness of over 970,000 citizens on issues such as land rights, gender equity and sustainable development. These beneficiaries include those who listen to the radio programmes and visitors to the websites of the local organisations that are implementing the projects. Analyses of radio programme audiences and website visitors confirm a high number of regular and increasing visits to websites as well as an expanding audience for the radio programmes.

Organisation	Project	Internet access points	Direct users	Indirect users
APCOB	Indigenous products (Chiquitano)	4	250	10,300
CIDOB	Land rights	8	925	700,000
Casa de la Mujer, CIPCA, ICO	Ondas Libres radio (Santa Cruz)	3	5,000	180,000
CEBEM	Network for sustainable development	1	10	82,230
Total		16	6,185	972,530

Source: Based on data provided by project partners 2000-2004

End users were profiled on the basis of a representative sample of 232 users interviewed in 2002, 2003 and 2004. End users of the project generally have lower incomes and education levels, in line with project targets. Yet the projects are slightly biased in favour of men and urban populations. This aspect needs to be addressed when the projects are expanded in future.

End users of good governance projects in Bolivia, 2002-2004¹⁶

Male 56% - Female 44%

Rural 34%

Below secondary education 73%

Below average income 92%

¹⁶ Information gathered from 232 end user questionnaires over three years as part of regular IICD Monitoring & Evaluation of the projects.

'We as women find it difficult to position ourselves in this country and therefore need to make use of every communication medium possible to stay informed and get our voice heard. This web page provides us with an incentive to take on a role as active players.'

Satisfaction and awareness

End users are positive about their participation in the governance sector projects: 86% of the interviewees indicated that their main objectives for taking part in the project had been achieved. The main reason they gave for taking part was to enhance their ICT skills and to improve communication channels and the flow of information between the indigenous and civil society organisations and individual citizens. Listeners to the radio programme Ondas Libres indicated that the programme helped them to learn more about several useful themes.

'As a reporter I am obliged to review and analyse all media and this web page provides an insight into the reality of our situation without any bias.'

Over 90% of the participants are fully or partially satisfied with the ICT training provided, including the training manual, facilities and technical support. Fifty-five per cent of the interviewees use the project on a daily basis.

In the case of the CIDOB project, which is helping to gather and disseminate information on conflicts and negotiations over land rights, most satisfaction was derived from the opportunities to be trained in ICT and information usage. The users of this project subsequently asked for increased access to training and more equipment.

'It helps both us as individuals as well as the indigenous organisation as a whole to voice our problems and speed up the legalisation of our land titles.'

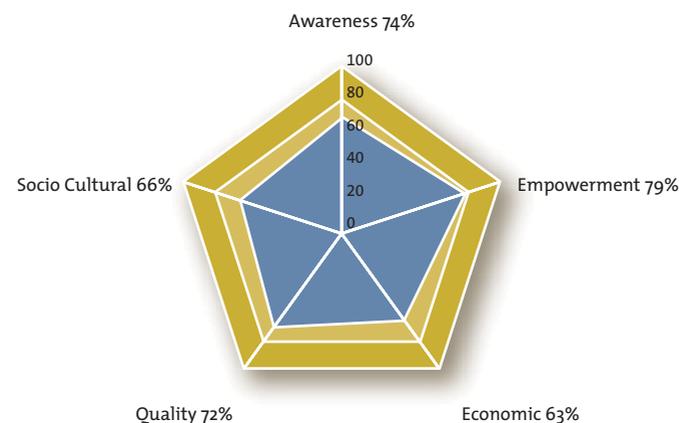
Impact

In addition to awareness, empowerment (particularly important in this sector), and economic impact, IICD has identified quality of governance as an additional indicator by which it measures the impact of projects on end users specifically in the governance sector.

During the years 2002-2004 a growing number of users indicated that ICTs had had a positive impact on them in terms of raising their awareness as well as on a socio-cultural level. Although the projects do not have an economic objective, 63% of the participants have nevertheless indicated that the projects have also had an economic impact on their lives.

79% of the interviewees believed that the project did contribute towards their empowerment. In this area, the majority of the participants feel that through this project they are more able to help other people, feel more confident and report that their self-esteem had risen. They also feel that they have more influence on the decision-making process. With respect to the quality of governance, the majority found that the project did increase the quality and transparency of government information. The increasing impact values indicate that the project organisations have continuously improved their services and that they have taken the additional and often growing demands and expectations of the target group into account.

Impact governance projects 2003-2004





Recommendations by end users

To enhance the level of satisfaction among end users and boost the overall impact of future projects, users identified a number of areas in which ICT projects in the good governance sector could be improved:

- Projects need to simplify the technical language of the Spanish information provided through the projects;
- Written information can be made more accessible by using more audio and visual components.
- Information should be updated more regularly, preferably on a daily basis;
- Expansion of equipment and continuous training opportunities for users.

Cases

Ondas Libres

The *Ondas Libres* (Free Waves) project is a good example of how ICT applications can be used to empower citizens in urban and rural areas and give them a voice. The project was set up in 2001 in the department of Santa Cruz by three local NGOs: Casa de la Mujer, the Centre for Research and Promotion of Peasants (CIPCA), and the Institute for Capacity Development in the Eastern region (ICO). Its goal was to use a combination of radio and internet to merge the radio audience that is currently reached by the three NGOs into one single audience, thereby significantly increasing its size to a total of 180,000 listeners. The radio programmes are uploaded at the Ondas Libres website, where participating NGOs can easily download radio programmes relevant to their listeners. Increasingly, organisations in other parts of Bolivia are also downloading the programmes that help to increase the coverage nationwide.

The project enhances social participation and integration by disseminating information about local concerns or relevant issues, such as gender, sustainable development, human rights, and agriculture that affects the lives of rural people and their livelihoods. The singular aspect of this project is that indigenous groups, small farmers' organisations, and women participate in the radio programmes and share their views with a larger audience. This way, the project is contributing to the democratisation of information by providing relevant information to the local community and giving them a voice.

Network for Sustainable Development and the Environment

The Network for Sustainable Development and the Environment is operated by the Bolivian Centre for Multidisciplinary Studies (CEBEM) in La Paz. It has helped to enliven the political debate on sustainable development topics and place them firmly on the political agenda both in Bolivia and in the international arena. Now operating independently from IICD, the network is based on a portal providing online newsletters, contact databases and discussion forums on topics suggested by the network's members. Network members are also responsible for most of the information presented. Particular attention is paid to creating awareness of, and stimulating discussions about, United Nations declared topics such as the 'Year of the Mountains', the 'Year of Water', etc.

With the internet acting as the central ICT mechanism, the main participants are specialists and academics in the urban centres of Bolivia. Launched in 2001, the network initially expected to attract around 7,000 individuals and institutions as subscribers. The final number far exceeded initial projections. Today, with 25,000 subscribers in Bolivia (70%) and the Latin American region (30%), the network has become one of the most active networks in the area of sustainable development. In this way, the project has opened up a virtual meeting place for people in Bolivia and in the wider region where they can come together to air their opinions on international and domestic political issues.

Information Network on Conflicts and Negotiations in Communitarian Original indigenous lands in Bolivia

In 2000, the *Confederación de Pueblos Indígenas de Bolivia* (CIDOB) launched a project called Information Network on Conflicts and Negotiations in Communitarian Original indigenous lands in Bolivia (*Red de Información sobre Conflictos y Negociaciones de Tierras Comunitarias de los Indígenas de Bolivia*). The project contributes to the process of negotiating for and monitoring agreements between the indigenous people and the national government. It also strengthens the direct participation of the regions in policies affecting their livelihoods and political rights.

The Confederation is the country's largest indigenous people's organisation and represents 52 indigenous groups from more than 1,500 communities. For over three centuries, indigenous groups in Bolivia have been fighting for the legalisation of the original indigenous territories. The Confederation has been locked in negotiations with the government to approve a law that recognises the claims of indigenous groups on their original territories and provides a mechanism of related land titles. However, conflicts arise over the exploitation of land by indigenous groups and competing private land owners and local government.

The project collects and disseminates information on land claims as well as the management of community lands for indigenous groups in Bolivia. This information is used to inform indigenous groups about the status of different land right claims, as well as to help them lobby for land rights at the government and international level. A database and website were created, and the information is collected through CIDOB's regional centres and updated in the database. The project provides equipment, training and information to their eight regional centres. To date, the project has trained more than 500 indigenous leaders. In addition to this, young leaders and students receive training in the use of ICTs, after which they go on to share their experiences with and provide training to the leaders of their organisation and members of the community in each regional centre.

The project is facing increasing demands for higher capacity internet access and more equipment and training. In response, CIDOB is pursuing additional funding from the Inter-American Development Bank and from SITTEL, Bolivia's national telecommunications regulator.

'The use of ICT has represented a change in the negotiations with the government or private companies (especially, oil companies) about land claims, as it enables us to stay up-to-date with relevant information. Thanks to the internet, we can easily contact our regional centres.' Pablo Rivero, Weehnayek indigenous people.

Network for Small Indigenous Producers

The Network for Small Indigenous Producers (*Red de TIC para el Pequeño Productor Indígena Chiquitano*) project demonstrates how ICT can improve governance by increasing social participation. The project is run by the NGO *Apoyo para el Indígenas-Campesino del Oriente de Bolivia* (APCOB).

The project aims to increase awareness about local and regional development for the Chiquitano community in the department of Santa Cruz, as well as involving indigenous communities in the decision-making process, thereby increasing their social participation. The Chiquitano Community feels the need to participate and be involved in decisions taken by the government. It is not enough to feel that they have a voice: they also want their voice to be heard by local governments and other segments of society. However, the low levels of organisation among the indigenous people in this region have also made it hard to secure local ownership of the project and make it sustainable.

To connect and inform the communities in the region, the project uses a combination of internet access through information centres in the larger communities, ham radio to communicate with isolated communities, and broadcast radio. The radio programme '*Chiquitanos in Contact*' provides information in both Chiquitano (the local language) and Spanish about the concerns of the community. Radio creates a space for social participation where indigenous groups can express their views, concerns and demand their needs to society in general. It also strengthens communication channels within the Chiquitano community by disseminating local and general information about their community.

5 National and sector strategies

Widespread poverty, a geographically and ethnically diverse population and frequent social conflicts make sustainable development in Bolivia a difficult process. The international donor community is providing extensive support to Bolivia, but this aid is mainly focused on supporting the government in its efforts to keep basic services functioning. In this context, the development of ICT programmes and policies is an even greater challenge. Yet IICD's experience in Bolivia demonstrates the value of ICT as an instrument to alleviate poverty and support economic development.

Creating awareness

An important first step is creating awareness among policymakers about how ICTs can be applied to enhance local livelihoods and empower people. Working alone, IICD's local partners cannot influence policy, so they have joined forces and are working together to advocate, based on their experience, for a pro-poor orientation in ICT policies and strategies at both sector and national levels.

Red TICBolivia was established in 2001 to link the 20 partners in the IICD Country Programme. Its main instruments are newsletters, a website (www.ticbolivia.net), workshops and press releases, by which it raises awareness about the use of ICT among policymakers, the media and the wider population.

Through the network IICD's local partners work together to:

- Create more awareness among policymakers and the donor community by sharing experiences and demonstrating the impact of ICT for development;
- Participate in the formulation and implementation of development-oriented ICT strategies within their sector and at the level of national ICT policy;
- Strive to have successful pilot projects and approaches scaled up and embedded within sector and national programmes.

National strategies

To ensure that ICTs are used to reach the development goals spelled out in the Poverty Reduction Strategy Paper (PRSP), it is important to make sure that local initiatives are not technology driven and that they serve the needs of the poor. This approach will help other agencies and the government to avoid reinventing the wheel.

Demonstrating the value of ICT in national and sector development will also help to secure additional funding for the projects and programmes and will enhance their chances of being scaled-up to benefit a larger group of end-users. This is the goal of the recently introduced approach of embedding which has been adopted by IICD and its partners in their quest for long-term sustainability.

Members of Red TICBolivia are currently helping the Bolivian government to draft a National ICT Policy, together with the Vice-Presidency, the national telecommunications regulator SITTEL and UNDP. The policy aims to establish an overarching vision for ICT for development at both national and sector levels – to provide coordination and set out guidelines for how ICT is used to support the Poverty Reduction Strategy.

The government of Bolivia began developing a National ICT for Development Policy in 2003, using a series of multi-stakeholder (government, private sector, and civil society representatives) thematic and regional consultative workshops to identify the principles and priorities of the policy. However, the recommendations and possible lines of action contained in the policy are very general. The risk of such an approach is that it does not take into account ICT initiatives that are already up and running within ministries, civil society organisations, and the private sector. In 2005, a more concrete policy framework and action plan is expected to come forward.

In anticipation of this, TICBolivia partners through the coordinating partner REDES, have established a series of key points based on their practical experience over the years, which they hope to see reflected in the policy. These are:

- Human capacities: developing capacities with respect for the local culture and practices;
- Content and applications: stimulating the development and use of locally created content, particularly in the areas of education and multicultural issues;
- Connectivity and infrastructure: guaranteeing democratic and universal access to information and communication using both traditional and modern ICTs;
- Setting standards and regulating the telecommunication and IT sectors: The government is to establish regulations and norms that result in affordable, high quality and equitable access to services, particularly in rural areas.

ICT strategy for agriculture

The lack of coordination and standardisation of agricultural information at the national level is a major problem that was first highlighted during the ICT Roundtable process on agriculture in 2002 and which has been encountered by all partners in TICBolivia. The lack of information standards, for example, makes it hard for organisations involved in information gathering, analysis and dissemination to exchange information with each other. To address this issue, IICD's local partner organisations are collaborating with the Ministry of Agriculture on the formulation and implementation of a *Strategy for the Application and Use of ICTs for the Agriculture Sector*¹⁷ which aims 'to coordinate

17 The Ministry of Agriculture, Bolivia, February 2003.

and promote the introduction, access, uses and application of ICTs in order to improve rural development in a more sustainable and participative way for the more impoverished sectors'. This is the first ICT sector strategy in Bolivia.

The strategy formulation process has been highly participatory. A range of organisations participated in the identification of problem areas and priorities in ICT and information exchange in the sector. Apart from TICBolivia partners, other representative stakeholders also participated in the formulation process through a series of workshops and consultations. They included various Chambers of Commerce, the Ministry of Economic Affairs, and the Ministry of Communications. This way, the Ministry increased the ownership of the ICT strategy within the sector.

The stakeholders identified the following problems:

- The lack of norms, methodologies and regulations that support the exchange of information;
- The lack of coordination and exchange of information between organisations within the agricultural sector;
- Limited and inappropriate use of agricultural information among small farmers;
- The lack of infrastructure as well as equipment to process, promote and exchange information between the Ministry and the regional agricultural branches of the Ministry;
- The lack of training in the use of ICTs and information management.

The strategy identifies information coordination as a key role for the Ministry of Agriculture in a sector which includes a great diversity of players and extremely complex information flows. By implementing the strategy the Ministry aims to keep track of all the activities and projects related to the use of ICTs in the agriculture sector and promote standards-based information gathering and dissemination. To enhance its capacity to do this, the Ministry began by strengthening the internal capacity of its own departments and bringing its own staff up to speed on information management and the use of ICTs. It set up an internal computer network, including internet access, for part of the Ministry staff. This was accompanied by an intensive training programme in information management and analysis for all of the departments within the Ministry and with extensive ICT training for Directors and Information Officers. Later in 2004, other personnel from the Ministry were included in the training programme.

To support external information services, an agricultural portal was launched by the Ministry in December 2003 (see: www.agrobolivia.gov.bo).

The second phase of the strategy began in 2004. The Ministry provided access to ICT and training to personnel stationed at its regional branches at the regional level (SEDAGs¹⁸). At this level, the regional branches will set up regional information networks governed by regional committees. The regional committees, made up of four representatives of the government, the private sector and NGOs, are responsible for raising awareness about the benefits of ICTs and coordinating and exchanging information at the regional level.

The idea behind the strategy is that by taking on an information coordination role the Ministry will help small farmers and others working in the agriculture sector to make better, more informed decisions and that this will help them to improve their productivity, production and commercialisation. This will have a positive impact on poverty alleviation and rural development. Strengthening the flow of information between the Ministry and its regional centres will also have a positive impact at the organisational level.



¹⁸ SEDAG: Secretary of Agriculture in each region.

ICT strategy for education

'All Bolivians have the right to equal, intercultural, participative, efficient basic and professional education that responds to the demands of human, democratic, economic, social, scientific and technological development of Bolivia and the world.' This is part of the vision proposed by the Ministry of Education. The strategy for Bolivian Education 2004-2015 responds to the principles of the Bolivian Poverty Reduction Strategy Paper, which considers education to be one of the tools that can be used to achieve income equality and reduce poverty. The strategy emphasises the importance of improving the quality of and access to education by strengthening the supervisory and regulatory capacity of the government body in the field of education¹⁹.

The sector currently faces several problems with regard to the use of ICT. Only a few schools are concerned about the importance of using ICT for development. There is a lack of information on the use, access, and potential of ICTs. Most schools only use printed materials or videos and are unaware of the potential uses of ICTs for education. In addition to this, there is a lack of training available to provide teachers and students with either the ICT skills or knowledge of the software that could be included in the curriculum. The lack of curricula in the use of ICT, equipment and infrastructure is seen as one of the major threats.

In light of this, ICT can make the organisation, in this case the Ministry of Education, more efficient and transparent by strengthening the government body in the Education sector. This is possible by improving the communication between the Ministry's headquarters located in La Paz and the decentralised regional offices, as well as including the use of ICT in the curricula as alternative learning methods.

It was on this basis that the Ministry of Education, with IICD's support, developed a National ICT Strategy for the education sector. The National ICT Strategy for the Education sector aims at improving the overall quality of and access to education and enhancing the efficiency and transparency of the sector. Stakeholders in the sector at both the national and the regional level – including the nine educational executive bodies of the government at regional level²⁰ and NGOs - all took part in the development of this strategy.

Taking the objectives of the national education policy as a starting point, the participants identified the following priorities for the introduction of ICT in education: ICT-based

teacher training; digitalisation of the curricula; the development of ICT-based support materials for intercultural and bi-lingual education; ICT infrastructure and equipment for secondary schools; teacher training centres and adult education; and support for the various educational administrative bodies at national, regional and district levels.

Based on the ICT Strategy for education, the Ministry of Education developed an implementation programme for the nationwide integration of ICT in the education sector. The programme addresses the priorities identified above and is integrated in the 5-year national education programme 2004-2008. This way, the programme can count on funding through the education budget supported by the government of Bolivia and the international donor community (Sector Wide Approach). To date, Swedish SIDA and Danish DANIDA have agreed to fund the programme.

To make use of the ICT experiences already in progress in Bolivia, the Ministry will establish strategic alliances with experienced Bolivian NGOs and other private organisations to implement the different components of the strategy. In secondary education, the organisations AYNI and APCOB will assist in implementing ICT facilities, teacher training, and in introducing ICT-based multi-cultural support materials. The institutions for adult education are seeking collaboration with the Catholic Church and teacher training centres are expected to develop new programmes with the University of Barcelona. This way, both the Ministry and the strategic partners will be able to sustain their ICT initiatives and improve the chance of success.

Key ingredients of the sector ICT strategy development process

- Capacity development – provide basic ICT training to Ministry staff, especially to the directors and information officers, as this creates a sense of ownership within the Ministry.
- Multi-stakeholder participation – The Ministry should involve a broad mix of organisations from the start, particularly local NGOs and grass-roots organisations, as they are well placed to help identify the problems and ICT priority areas of the end users.
- Focus on coordination – To ensure sustainability the focus should be on coordinating knowledge exchange from existing information sources and exploiting existing communication channels, rather than creating new ones. This entails that the Ministry develop collaborative relationships with the different stakeholders involved in information creation and dissemination within the sector.

¹⁹ Bolivian Poverty Reduction Strategy Paper - Summary, 2001, p. 9.

²⁰ SEDUCAs in the Departments of Santa Cruz, Chuquisaca, Potosi, Tarija, Oruro, Beni, Pando and La Paz.

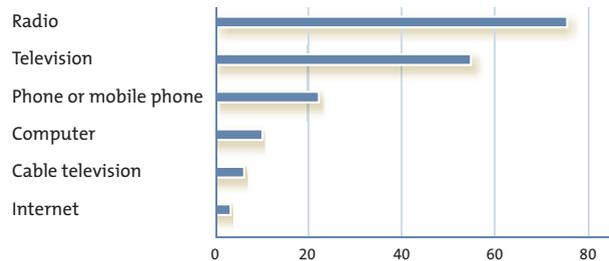
6 Technology approaches

Bolivia is a low income country with difficult terrain and generally poor roads and telecommunications infrastructure. In Bolivia, only 25% of the rural population has access to electricity. Finding the means to communicate, especially in rural areas, requires innovative combinations of traditional and modern means of ICT infrastructure and applications. This chapter examines the infrastructure limitations facing the projects and describes some of the technical solutions they have found.

Communications infrastructure

Source: UNDP - HDR 2004

Access to technology in Bolivia



Telephone

Telephone, a key condition for dial-up internet access, is provided by the national operator Entel Bolivia, which provides fixed line service as well as a mobile (cellular) network. Another company Telecel also provides mobile phone access with coverage in major cities and towns throughout the country. UNDP reported in 2004 that more Bolivians now have mobile phones than home telephones. In spite of this growth, access to telephone is still only 22.6% of the population and there is a great rural-urban disparity in access to telephone. Liberalisation of the telecoms sector has underlined the fact that investing in rural infrastructure is hardly an attractive business proposition. IICD projects in rural areas find that that inadequate and expensive telephone coverage creates a major obstacle to being able to deliver information and communication services in remote communities, and they have frequently sought alternatives to telephone for both routine communication and internet access.

Radio

75% of Bolivians have access to a radio, making this the most popular and accessible means of communication available. The country has 400 radio stations, but fewer than 50 broadcast in rural areas and most of these have a purely commercial format. Nevertheless, TICBolivia partners APCOB, ACLO, ICO, CEPAC and Ondas Libres have very effectively combined existing information centres with rural radio to deliver information to populations in remote parts of the country. A number of these programmes have become leading information sources reaching hundreds of thousands of listeners. Radio can enable the projects to reach over 75% of the rural population in the targeted region. The medium has a limitation in terms of the complexity and volume of information that can be distributed. Therefore the programmes are also used to direct people to the information services available in the information centres supported by these organisations.

Internet access

Based on the Network Readiness Index there are only 1.2 personal computers per 100 people in Bolivia and the percentage of Bolivians with internet access in Bolivia is small compared to the rest of the world. The International Telecommunication Union reports that while access to internet at the global level is 10%, in Latin America it is 6% and in Bolivia it is 3% (of these, the vast majority are educated, well off, and live in cities).

World population	560 billion	
Internet users in the world	35 billion	10%
Bolivian population	8,2 million	
Internet users in Bolivia	270,000	3%

Source: International Telecommunication Union - 2003

Rural-urban divide

In order to address the limited rural access to telephony and the internet, several plans have been launched over the years to increase rural connectivity. Major initiatives were introduced by the Ministry of Telecommunications, including a large programme to install rural Telecentres. Yet, this programme has still not got off the ground. Other smaller initiatives have been undertaken by various NGOs, but none has been scaled up to address the overall problem of rural access.



The digital divide between rural and urban areas in Bolivia is considerable. The two main obstacles are the lack of connectivity and the absence of infrastructure in the rural areas. Investments are very rare as the capital required is high, particularly when compared to the low and slow return. These conditions have a very significant impact on the planning and implementation of ICTs. The lack of telephone and internet connectivity represents a major constraint to the introduction of ICTs in general.

Reaching the 'last mile'

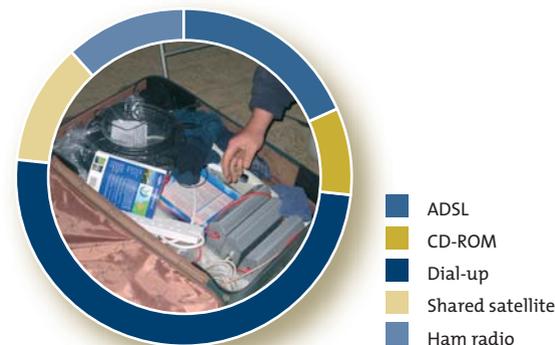
To address the limited access to ICT infrastructure to reach users in rural areas, the general set up of the information architecture within a project is as follows:

- PCs, LAN and internet connectivity at the urban headquarters of the organisation;
- A small number of PCs at information centres or school computer labs at community level in rural areas, linked up to headquarters via ham radio, or internet, if available; in some cases information is delivered on CD ROM.
- Ham radio sometimes used to deliver messages from information centres linked to the internet and outlying villages;
- Rural radio to broadcast information widely to surrounding communities.

This structure reflects the need for an effective combination of modern and traditional ICT applications to create an unbroken (and ideally two-way) information flow between centre and periphery.

Out of the 86 information access points in the projects, high speed internet via ADSL is available at most of the project organisations' headquarters in the major cities. These central hubs also have networked computers and the capacity to collect and disseminate information using database driven websites.

Information access in TICBolivia projects



Source: TICBolivia, 2004

The situation is radically different and varies widely in the 70 rural information centres. In a number of these centres, connectivity is not available either because there is no telephone or because the centre cannot afford connectivity. In some cases, information is physically distributed on CD and stored on a personal computer for access by end users – by no means an ideal solution. Alternatively, around 10 centres communicate with headquarters via ham radio (two-way radio communication also known as amateur radio). While it is not possible to exchange complex information using this medium, this voice-based system provides an affordable and effective means of communicating meeting announcements and basic price and market information.

Dial-up internet

Many centres currently have access to a telephone line which can be used for dial-up internet. However, the connections are too slow and expensive to permit web surfing, because of the need to dial long-distance to the Internet Service Provider. Still, this way partners do have a basic internet service at their disposal if usage is restricted to supporting email exchange and the usage time is limited.

Shared connectivity

Many partners are finding that dial-up internet is not a viable solution. Not only is it inadequate in centres that wish to offer telecentre-type services, it is very expensive because of the high cost of telephone. Therefore, IICD and its partners have introduced microwave or satellite connectivity in some centres. The service supports low-speed (19.2 kbps) to high-speed connectivity (2 mbps). Apart from the initial investment costs (US \$5,000 to \$20,000), monthly costs vary from \$250 to \$750.

An individual organisation cannot afford to pay these costs. To make it affordable, the partners have arranged to share the access and the associated costs among several community organisations, such as the local government office, farmer's association, hotel, school or hospital. The parties are linked up to the central connection via wireless radio (WIFI). The cost to connect additional parties is around \$500 to \$1,000. IICD is currently exploring the possibility of replacing WIFI with a cheaper alternative, 'Meshed Box' technology, which will be piloted in 2005. At this moment, 10 centres have been able to make use of this solution, which represents a new and very promising model of satellite access for development in Bolivia. Lessons learned from the experience to date with shared connectivity can be found in Chapter 8.



Software

IICD's local partners have adopted many different software applications. Most have local area networks including central email and document sharing at headquarters and, where possible, in the information centres or in the computer labs at schools as well. For dissemination activities, most projects combine a website with email based newsletters, and some have developed interactive CDs. They communicate using email, instant messaging and discussion lists. Voice over IP is being adopted where high speed internet is available.

Software used by TICBolivia partners

Purpose	Application
Search engines	Google, Altavista, Yahoo, MSN
Instant messaging	Yahoo, Skype, Netmeeting, AOL
Email clients	Outlook, Eudora
Web browsers	Explorer, Netscape, Firefox
Web applications	PHP, Deamweaver, Flash, Frontpage, Cold Fusion
Web statistics	Various freeware packages
Graphic design	Photoshop, Freehand, Fireworks, Paint, Photo Impact
Animation	Swift 3D, 3D Max Studio, Maya
Databases	Access, Excel, MySQL, Dbase, Visual Fox Pro
Audio editing	Cool Edit, Adobe Studio
Video editing	Premiere, Pinnacle Studio, Windows Movie Maker
Multimedia	Director, Flash, PowerPoint, Demoshield
Servers	Linux, Windows
Desktop operating systems	Windows, Linux
Security	Norton, Linux

7 Capacity

From simple to sophisticated

Most partners started with very simple applications and have developed their capacities over time. With experience, they are moving to more advanced software applications. For example, most projects have evolved from static website applications to dynamic websites supported by a database and content management system. In the same way, the use of CD ROMs has evolved from basic information storage media to interactive multi-media. Teachers working with the Ayni foundation initially developed materials using basic presentation tools. Now, the project staff are helping the teachers incorporate multimedia elements into their teaching materials. Agrecol has also moved from simple to more sophisticated applications in developing farmer-to-farmer presentations that document local environmental knowledge.

In many cases software that was first introduced in a project setting has spread throughout the organisation, along with the capacity to use it effectively. Examples include the development of a planning and budget application by the Ministry of Agriculture and for local governments by partner organisation CEPAC. This is a promising sign that the projects are contributing to the institutional development of the implementing organisations.

Open source software

Most of the partners in TICBolivia currently work within a Windows environment and use proprietary software, which entails ongoing licensing fees as part of the project costs. It is no longer the case that there is a shortage of consultants and training in open source alternatives. In general, there is sufficient capacity to train partners in open software solutions, but the training and consultancy is offered in a less institutionalised way. Recently, there has been an increase in demand for open source alternatives, reflecting increasing awareness, and a trend towards switching to open source options for servers, websites and databases. So far only Ayni has opted for open source on the desktop, yet here too there is increasing interest in open source alternatives among the partners, reflecting the increasing stability and reliability of these applications.

In order to use ICTs for development, a range of capacities are required. For implementing organisations these include both technical skills and 'soft skills' in areas such as project formulation, project and human resource management and fund raising. For end users, many of whom have never used a computer before, awareness-raising is the first step.

Since 2001, IICD's training partners have delivered 23 courses and 7 seminars for a total of 700 participants. Local partners themselves have trained over 4,000 end users in basic ICT skills. Among them are government officials, farmers, indigenous people, teachers and students.

Needs of implementing organisations

IICD has found that the technical staff of its partner organisations do have the basic capacities they need to carry out the projects successfully. This is in contrast to the situation in many countries in Africa. In Bolivia, most people working at this level have at least secondary education and some professional experience. This provides a good basis on which to build supplementary skills to carry out ICT4D projects.



Training courses offered to TICBolivia project staff

Technical skills

- Basic Internet/web use
- Website development
- Database development
- Website usability and statistics
- Multimedia – interactive CD-ROMs
- Advanced connectivity solutions
- LAN and server installation and management
- PC-network maintenance
- Train-the-trainer methodologies and materials
- Network security, viruses and spam
- Linux and Open Source

Soft skills

- Content management
- Newsletters – design and writing
- Telecentre management
- Information networks – monitoring and lobbying
- E-commerce
- Information management
- Project management
- Drafting service level agreements

Needs of end users

Making use of hands-on computer applications requires that end users be literate in Spanish and have a basic level of ICT skills. Although Bolivia has a high literacy rate, Spanish literacy and ICT skills are by no means widespread in rural and remote parts of the country. IICD partners deliver information services using highly accessible media such as pictures, audio, video. The information is provided in local languages and basic Spanish. This is combined with extensive and continuous capacity development in basic ICT literacy among end users.

In training end users, best results were obtained when the organisations organised and delivered training themselves, rather than relying on the IICD capacity development programme. This led to a greater level of understanding and buy-in at the community level. With this in mind project teams are trained via a Train-the-Trainer programme, learning particular training methodologies. Partner organisations then deliver training for end users that is highly customised to the needs of the project.

In order to participate directly in the management and maintenance of the information centres and to be able to contribute information to the projects themselves, end users require direct and applied ICT training (computer, email, chat, and searching information via electronic libraries and the internet). Word processing skills are essential to prepare correspondence and formulate project proposals; spreadsheet training allows users to improve their skills in calculation and financial planning. Finally, presentation applications are important for teachers and students and for farmers assisting in the systematisation of farmer practices.

Training courses offered to end users

- Basic computer skills
- Writing – correspondence and project proposals
- Financial planning using spreadsheets
- Documenting experiences using presentation software
- Using audio technologies
- Video – filming techniques and use in multimedia presentations
- Managing information centres



Methodology

IICD staff provide strategic and operational advice to partners on a regular basis during field visits. Other aspects of capacity development are delivered by local consultants, principally by one or more training partners identified in each country.

The capacity development programme consists of the following elements:

- Institutional support for IICD's training partners: Advice and training in the necessary technical and didactic methods is provided to IICD's training partners on the ground;
- Training for the project teams: Provision of training based on a productive training methodology that allows partners to apply both the skills they have gained and their newly acquired knowledge directly to the implementation of their projects;
- Technical Update Seminars: Awareness raising sessions for local partners and the general public on new technological developments;
- Train-the-trainer courses: Training project teams in methodologies for end user training;
- Provision of training modules and training of end users by the project team, allowing the direct use of information services provided by the partners at the local level.

Training partner

In 2001, the Bolivian ICT company Enbolivia set up a training centre called Captic (Centro de capacitación en tecnologías de información y comunicación) (www.captic.org) to deliver ICT training to TICBolivia partners and others. Enbolivia.com is a private company so the training centre has to be self-sustaining. In this respect Captic has made excellent progress. 60% of its clients now come from institutions outside the TICBolivia network. After three years, Captic is now fully self-sufficient.

When Captic first started it was one of only a handful of ICT training centres in the country. Its location in La Paz made it very difficult for people from remote and rural areas to be trained. In 2004 EnBolivia.com and CIDOB set up a second centre in Santa Cruz. There are now more and more training providers in the country and project partners have a range of options including consultants such as Entra 21, Cognos, and Aspire Systems.

External expertise

In cases where capacities are not available IICD also makes use of international consultants through an agreement with consultancy companies in the Netherlands, including Cap Gemini Ernst and Young and Atos Origin. This way, partners have access to more specialised expertise and knowledge in advanced ICT such as multimedia, e-commerce and the latest connectivity technologies such as WIFI and Meshed Box applications.

Results

An evaluation carried out by the TICBolivia project partners during 2002 and 2003 found that the strategic and operational advice provided by IICD and local consultants was rated as satisfactory in most areas with satisfaction rates rising to more than 70% among the project team members. As for training, most of the participants evaluated the courses positively as far as the materials, trainers and logistics were concerned. To raise the satisfaction rates of participants beyond the current 60%, improvements are being sought in the provision of more customised and hands-on materials.

Appropriate training materials that are suitable for farmers or teachers who have not previously been exposed to ICTs are hard to find, and it is best if the materials are developed locally. Local partners in TICBolivia have developed such materials on basic computer skills (word processing, spreadsheets, etc.). To allow other interested parties to use and build on these modules will be published under an open content license on www.itrainonline.org.



8 Community information centres

Several valuable lessons have been learned during the process of setting up community-based information centres with internet access throughout Bolivia. There are 86 such access points in the TICBolivia programme, and 70 of these are in remote, rural communities.

Information needs

Assessing the information needs and priorities of the farming community requires regular evaluation meetings with the stakeholders to make adjustments to the type of agricultural information distributed and collected and the form in which it is presented. One result of these meetings is that the radio programmes and custom-made advice in the information centres were found to be a more effective means of communication than paper-based studies and brochures. Despite the encouraging participation of many producers, evaluation results indicate that even more farmers should be drawn into a project and encouraged to take more ownership of the centres and the project as a whole.

Staffing

The best results are obtained when the manager of the information is a member of the community and understands the information needs and cultural context well. Finding the right person – one who also has the fairly high level of technical knowledge required to maintain the ICT infrastructure – is a challenge. IICD has found that the problem with having a technical specialist manage the centres is that they are unable to anticipate the farmers' information needs. Conversely, a farmer trained in ICT will often have to leave the centre unattended because of pressing farming duties. In five cases local extension officers were engaged to manage the centres. This worked out well in two of the centres, but in three others it involved extensive negotiation with local governments, and in the end, the officers' other duties also took them away for long periods. A fourth option is currently being explored: training young farmers (farmers without major commitments) in ICT so that they can run the centres.

Reaching target groups

IICD's experience has shown that reaching target groups has a lot to do with the issue of community ownership and how the information centre is perceived. Publicly accessible community information centres that offer internet access tend to attract a more educated public interested in using services such as email and chat for their

own personal purposes. The fact that the centres are sometimes monopolised by students and others has meant that farmers, indigenous leaders, and certainly women are unable or unwilling to frequent the information centres. If all the computers are occupied by web-surfing young men, members of the actual target group of the project are reluctant to go inside.

Turning people away creates a conundrum: exploiting the maximum capacity of the information centres will ensure their long-term sustainability. Yet this may serve to exclude the very people the project is designed to serve. One solution may be to set up dedicated facilities for students and other 'paying customers' in parallel with the project-focused information services and share the costs (and revenues) among the two.

Farmers are very busy and are only available at certain times of the day, so the issue of opening hours and access is critical to the success of the project. Opening hours need to be geared to their agricultural routines.

The location of the centre can have an impact on who uses it and who takes ownership of it. For example, a centre for agricultural information should be owned and administered by a farmers' association. If students are the target group, the centre should be located on the school grounds.

Content is another factor. To ensure frequent visits by the target group, it is also essential to provide relevant content for that target group and preferably also ensure that the target group is directly involved in the development of local content. IICD has also found that the best results are obtained when the centre is staffed by a content specialist rather than a technical person.

Participation of women

The number of women coming to the centres is low, partly because of severe constraints on their time and partly because they perceive the centres as being places predominantly frequented by men (which they are). More needs to be done to encourage women to make use of the information centres. If the centres are to reach out to the key target group such as farmers, indigenous people, or women, it is necessary to provide basic ICT literacy training and make explicit time slots available for the specific group.

9 Lessons learned

Financial sustainability

A major challenge is to make the information centres and the project as a whole financially sustainable. In some centres, revenues from the payment of a percentage of export revenue can partially cover project costs. But this is usually not enough to cover all costs, and many of the member organisations currently taking part are resistant to the idea of paying for services. On the other hand, evaluation of one information centre which charges for services indicated that farmers were willing to pay for good information. The issue of revenue generation, given the project objectives and extreme poverty of the target groups, is far from being resolved.

More promising results have been obtained in lowering operating costs. Because connectivity is such a large part of the cost of running the centres, the shared connectivity model discussed below, whereby the information centres share the cost of internet access with other local organisations, can help the centres achieve sustainability and vastly improve the quality of their services.

Shared connectivity – lessons learned

A recent evaluation of the shared connectivity model has indicated that within a time frame of one year, two of these centres have become fully sustainable and capable of maintaining the services both from an organisational, financial and technical perspective. On the basis of these experiences, a number of lessons can be learned:

- To sustain the service financially, at least four community organisations should commit to sharing the costs of satellite services, e.g. a local government office, school, hospital, farmer association, etc. Organising and negotiating cost sharing is a complex process that takes some time.
- It is important to set a clear and formal organisation structure including a service agreement with all parties involved.
- Administrators of the information centres need to be trained in organisational and financial management to ensure that the centres are run in a viable way. The most successful information centre administrators are those with a thorough knowledge of their target group.
- Administrators of the information centres also need advanced technical skills to manage the internet connection and keep the equipment in good working order. High level technical knowledge is required to install the service, and this is often done by external consultants. It is especially difficult to install complementary software such as firewalls and to configure personal computers and routers.

The key lessons learned during the first four years (2000-2004) of implementing the Bolivia Country Programme are outlined below. They are based on hands-on experience acquired by more than 20 local organisations during the process of developing and using ICT applications in three sectors – agriculture, education and good governance – and from working closely with the Bolivian government to develop ICT policies and strategies at the sector as well as at the national level. Throughout this four-year period regular feedback was systematically gathered from local partners and end users including leaders of indigenous communities, agricultural producers, government officials, and secondary school teachers and students.

Successes and achievements

By the end of 2004, the Bolivia Country Programme had helped local organisations to: establish 86 information centres (mainly for the benefit of farmers and indigenous communities), train 4,400 individuals in how to use ICTs, launch 15 ICT projects in three sectors, and set up Red TICBolivia, a national ICT for development network. In addition, IICD and its local partners were invited by the Bolivian government to assist and advise the Ministry of Education and the Ministry of Agriculture, as well as the government as a whole, in developing sector ICT strategies and policy for the country. By the end of 2004, half a million people were benefiting either directly or indirectly from the ICT services provided via the Bolivia Country Programme (mainly due to the wide reach of successful radio programmes) and the Ministry of Education was in discussions with partners regarding embedding the education projects developed under the Country Programme into the government's five-year education strategy.

The process of 'mainstreaming' ICT into the core activities of the institution is an important means to achieving sustainable impact. IICD has seen first hand how ICTs contribute to developing institutional capacity in civil society and public sector organisations working for Bolivia's development. ICTs quickly became integrated into the organisations, moving from being project-based to being institution-based, inspiring staff to integrate them into their day-to-day operations. This effect can be seen in the case of CIOEC, which has now incorporated ICT-enabled information services into its core business, and has been successful in attracting more donor funding as a result of improved service delivery. This is one level of sustainability; helping projects operating at a community level become financially self-supporting is a challenge of a different magnitude. As with CIOEC, awareness of the value of ICT and broad-based capacity are important factors in making this happen. Most of the telecentre-type services supported under TICBolivia are seeking to continue operating independently under the full ownership of stakeholders within the community, with user fees in some cases but mainly subsidised by local organisations such as farmers'

associations. This level of demand and community ownership entails that ICT awareness and capacity need to be spread widely within the social fabric. Only by appropriating and working with technology over time and achieving tangible results can this process take hold.

Impact on MDGs

In many cases the Bolivian Country Programme has shown how ICTs can play a role in helping to attain two key United Nations Millennium Development Goals (MDGs): eradicating extreme poverty and hunger and achieving universal primary education.

Agriculture

IICD has measured a direct positive economic impact of 58% among end users of the agriculture projects it supports in the country. A clear example of how information can bring immediate material benefits to farmers is up-to-date market prices. Collected and compiled using ICTs and disseminated as quickly and as widely as possible in outlying communities via radio, this information clearly gives rural producers greater negotiating power in dealing with middlemen. TICBolivia has given significant input to the nation's ICT strategy for the agriculture sector, with a strong call for the Ministry to take on the challenge of bringing coherence to the flow of agricultural information in the country.

Education

The education projects supported under the programme have a wide reach. Both projects are working with both primary and secondary education and have improved the skills of teachers and administration including school principals. The majority of the

participants in these projects felt they had acquired skills that increased their chances of success in the job market. The projects, while not directly tied to the MDG priority area of universal basic education, nevertheless serve to strengthen the education sector and prepare educators for a future in which ICTs will be more prevalent in the classroom and also present in the lives of the next generation. IICD has supported the development of a National ICT strategy for the education sector which will integrate ICT into the classroom, curriculum, and teacher training programmes.

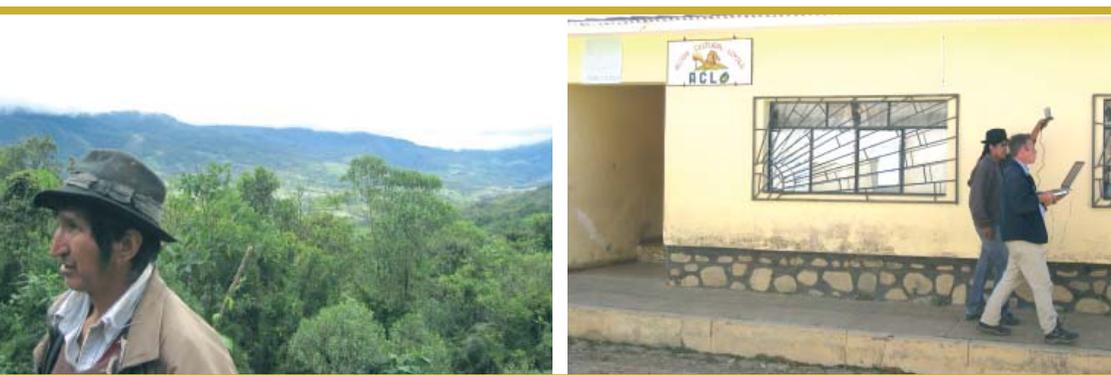
Governance

Projects in the governance sector are relevant to the goal of the Bolivia Poverty Reduction Strategy to empower citizens, reflecting the importance of empowerment and social participation in combating poverty in the country. Projects in the governance sector reported not insignificant economic impact (63%), but their main contribution to sustainable development is undoubtedly the way in which they empower indigenous communities to express themselves, document their culture and environmental concerns, organise and understand their rights. The participation of IICD partners in national policy processes has contributed to good governance by ensuring that civil society and organisations representing small-scale farmers, indigenous groups are present at the table when decisions regarding national ICT policy are taken.

Challenges

Some of the most persistent challenges encountered in Bolivia are also encountered to a greater or lesser degree in IICD's other focus countries. These are:

- Lack of experience among local partner organisations in developing and implementing projects, which requires additional and continuous institutional strengthening;
- Shortage of locally available technical advice (although this problem is not as acute in Bolivia as in other IICD focus countries). The issue can be addressed in part by exchanges of technical staff between projects;
- Low levels of female participation in the projects at the community level, requiring explicit attention to include women in training and specific access times for women in information centres;
- High staff turnover among local partner organisations, resulting in newly accumulated ICT skills and knowledge being lost. To mitigate the effects of 'brain drain' there must be increased attention to spreading ICT skills and generating understanding and buy-in throughout the organisation;
- Constant pressure on project partners to find outside funding for their project to ensure its long-term sustainability; and
- Rivalries and frictions that stem from working in a multi-stakeholder environment.



Challenges unique to Bolivia included:

- Lack of organisation among some indigenous communities which causes delays in some projects;
- The country's diverse population and multitude of languages;
- Frequent changes in government which destabilises projects that depend on government support; and
- The rugged, mountainous geography which creates difficulties in bringing internet connectivity to remote and rural areas.

Key Lessons

IICD has drawn the following lessons from its four years of support for ICT-enabled development in Bolivia. These lessons should be particularly relevant for policymakers, donor agencies, and implementing organisations not only in Bolivia and the Americas, but in other developing country contexts as well.

- Engage with policymakers
- Involve end users early and often
- Develop ICT and institutional capacity
- Help partners learn from each other
- Cultivate strategic alliances
- Find innovative connectivity solutions

Engage with policy-makers

Embedding projects or elements of projects at the sector and national level will help to preserve their impact long after the Country Programme has ended. This is the ultimate goal of each Country Programme: to translate best practice into the overall approach to ICT4D in the country. The close working relationship that develops between IICD, its local partners, and the ministry during the policy formulation process often creates opportunities to embed and scale up successful pilot projects. This is how the 20 computer labs set up by Fundación Ayni led to discussions with the Ministry of Education regarding the possibility that Ayni help set up computer labs all over Bolivia and provide countrywide ICT training, with funding provided through the sector wide education programme supported by the Netherlands and Swedish government.

There are risks associated with too much dependency on government. On one hand every time the government changes the continuity of a project or policy can be interrupted or threatened. This is a particular problem in Bolivia where there have been three changes in government and even more changes in ministers since 2000. Also, government agencies everywhere tend to be slow and bureaucratic compared with civil society and private enterprise, which means that if any aspect of the project requires approval long delays can result.

Nevertheless, by engaging with policymakers the stakeholders in the Country Programme, principally from civil society, have an opportunity to get the priorities of the poor on the agenda and to ensure also that national and sector policies take into consideration their actual experience of what works and what doesn't in a particular national context. In so doing the partners are performing a valuable service for their fellow citizens and contributing to the country's long term development.

Involve end-users early and often

IICD's experience in Bolivia has reinforced the point that it is important to bring the end users on board at a very early stage to ensure that a project meets their needs and that they understand and take ownership of the services provided. A good example of this is the Information System on Public Investment for Small Producers in Agriculture. The key to the success of this project was that it started off by consulting farmers on what information they wanted, then worked out how they could access the information, and finally used ICTs to implement the process. Significantly, this approach brought about a basic change in farmers' behaviour: having witnessed the benefits that ICTs can bring in the form of timely and accurate information, they are now actively demanding more information centres, services and training. Such an approach helps ensure that projects are demand-driven, not 'technology-driven' – a frequent pitfall when it comes to ICT4D.

Develop ICT and institutional capacity

IICD has found that the level of technical capacity in its partner organisations is quite high in Bolivia. Most people working at this level in the country have at least secondary education and some professional experience. This provides a good basis on which to build supplementary skills to carry out ICT4D projects. IICD learned over time that there was a need to complement technical training in partner organisations with so-called 'soft skills' in areas such as project management and finance. IICD also expanded its network of training providers in the country to ensure that projects in more remote provinces also have access to training facilities.

In training end users, many of whom have never seen a computer before, best results were obtained when the organisations designed and delivered training themselves, rather than relying on the IICD capacity development programme. This led to a greater level of understanding and buy-in at the community level. With this in mind project teams are trained via a Train-the-Trainer programme, learning particular training methodologies. Partner organisations then deliver training for end users that is highly customised to the needs of the project.

Help partners learn from each other

The approach taken in IICD Country Programmes in Bolivia and elsewhere to involve implementing partners in national-level networks has helped to increase the overall impact of the programme. Because many of the projects share common challenges, the network is a place where the partners can learn from each other, join forces in lobbying efforts, and benefit from each other's experience and contacts. A small example is the way that NGOs and farmers' associations participating in TICBolivia directed their members to the services provided by another TICBolivia project run by the ecological agriculture association AOPEB and the export promotion centre CEPROBOL, resulting in new export opportunities.

Another platform for sharing learning among project teams is Monitoring and Evaluation (M&E). Ongoing M&E activities take place in each of IICD's nine focus countries, and these are directed not only towards accountability but also towards learning. In addition to questionnaires and discussions with end users, regular Focus Group Meetings give local project teams the opportunity to share their concerns about their respective projects, discuss problems, and come up with possible solutions. The objective of the meetings is to harvest lessons learned and use them to improve the projects and the programme as a whole. Successful focus groups depend on trust, honesty and openness of the facilitator and the participants. Initially, project teams were reluctant to share their difficulties as they were concerned that the meetings might descend into a finger-pointing exercise. Over time, a total mental shift has taken place: trust has been established and project teams are now convinced of the learning value and supportive intention of the process. Some have started to share the results directly with the end users, who provide the projects with critical feedback on the services provided.

Cultivate strategic alliances

Most of the TICBolivia partners are NGOs, and they often lack sufficient financial resources to scale up successful projects. In Bolivia strategic partnerships brokered by IICD have helped some projects expand their reach and mobilise additional resources. One such deal involves Transredes, one of Bolivia's largest gas pipeline operators, which has agreed to donate hundreds of its used PCs to TICBolivia information centres all over the country. By the end of 2004, the first batch of 30 PCs had been delivered. Another strategic alliance with the government is a collaboration with the Bolivian Agency for the Development of the Information Society, responsible for the national ICT strategy. Recently, this resulted in a request to become a member of the TICBolivia network, enhancing the political positioning of the network in Bolivia.

Find innovative connectivity solutions

Poor rural connectivity is a major challenge in most developing countries, and the same is true in Bolivia, a challenge made greater by the country's large size and mountainous terrain. Telephone infrastructure in rural areas is generally poor and quite expensive; dial-up internet access in communities that do have telephone is possible, but not ideal. In communities without telephone, a low-tech approach that is nevertheless very reliable is radio – broadcast radio to disseminate information such as market prices, and ham radio to provide a two-way communication link between regional towns and outlying villages.

A very promising approach is shared satellite connectivity, in which several local organisations including the TICBolivia partner share a single satellite link to the Internet and related costs. Local organisations including schools, health centres connect to the Internet hub via a strong wireless network. The first connections are now operational in the small communities of Vallegrande and Lomerio, 200 and 600 kilometres from Santa Cruz. Satellite connectivity is much faster than traditional dial-up, and thus brings all the benefits of convergence – internet radio, multimedia, and voice over IP (telephone over internet) – to communities which previously did not even have telephone.

10 Partners

TICBolivia partners and projects

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Governance

Apoyo para el Indígenas-Campesino del Oriente de Bolivia – APCOB
Red de TIC para el Pequeño Productor Indígena Chiquitano

CIPCA, Casa de la Mujer, ICO
Red de Productores de Radios Locales 'Ondas Libres'

Confederación de Pueblos Indígenas de Bolivia – CIDOB
Red de Información sobre Conflictos y Negociaciones de Tierras Comunitarias de los Indígenas de Bolivia

Education

Apoyo para el Campesino – Indígenas del Oriente Boliviano – APCOB
Materiales Etnográficos en Sistemas Multimediático para la Educación

enbolivia.com
Centro de Capacitación en TIC

Fundación Ayni Bolivia-Nederland
Programa Ch@ski GTP en Bolivia

Ministerio de Educación
Estrategias en nuevas técnicas de información y comunicación para el sector educación



Livelihoods

Asociación de Organizaciones Productoras Ecológicas de Bolivia – AOPEB

Centro de Información Técnico Comercial del Sector Agro - ecológico de Bolivia

Centro de Promoción Agropecuaria Campesina – CEPAC

Sistema de Información para la innovación tecnológica y competitiva de pequeños productores de la provincia Ichilo

Centro de Promoción Bolivia – CEPROBOL

Sistema de Información y Asesoramiento en Comercialización para Productores Agrícolas

Coordinadora de Integración de Organizaciones Económicas Campesinas de Bolivia – CIOEC

Sistema de Información para el Seguimiento de la Inversión Pública en el Sector Agrícola y oportunidades de comercialización de las OECAs

Fundación Acción Cultural Loyola – ACLO Chuquisaca

Sistema de Información Campesina – Indígena

Fundación AGRECOL Andes

TIC para documentación e intercambio de experiencias en agricultura ecológica campesina

Instituto de Capacitación del Oriente

Sistema de Información y Monitoreo Agrícola en los Valles Cruceños

Ministerio de Asuntos Campesinos y Agropecuarios – MACA

Política y Estrategia para Implementar TIC para el Sector Agropecuario

International partners

Agencia Española de Cooperación Internacional – AECI

www.aeci.es

Canadian International Development Agency – CIDA

www.acdi-cida.gc.ca

Catholic Organisation for Relief and Development Aid – Cordaid

www.cordaid.nl

Dutch Directorate-General for International Cooperation – DGIS

www.minbuza.nl

Humanistic Institute for Development Cooperation – Hivos

www.hivos.nl

Ministry of Foreign Affairs of Denmark – Danida

www.um.dk

Styrelsen för Internationellt Utvecklingssamarbete – SIDA

www.sida.se

Swiss Agency for Development and Cooperation – SDC

www.sdc.admin.ch

UK Department for International Development – DFID

www.dfid.gov.uk

Collaborating partners in Bolivia

Agencia para el Desarrollo de la Sociedad de la Información en Bolivia – ADSIB
www.adsib.gov.bo

ENLARED Municipal
www.enlared.org.bo

Aspire Systems, Inc.
www.aspiresys.com

Asociación de Instituciones Financieras para el Desarrollo Rural – FINRURAL
www.finrural-bo.org

Centro Boliviano de Estudios Multidisciplinarios – CEBEM
www.cebem.org

Estrategia Nacional de Tecnologías de Información y Comunicación para el Desarrollo – ETIC
www.etic.bo

Red de Desarrollo Sostenible y Medio Ambiente – REDESMA
www.redesma.org

Superintendencia de Telecomunicaciones de Bolivia – SITTEL
www.sittel.gov.bo

Tecnología y Conocimiento – COGNOS
www.cognos.com.bo

TRANSREDES
www.transredes.com