

ICTs IMPACT ON DEVELOPMENT IN BOLIVIA

THE EXPERIENCE OF THE BOLIVIAN ICT NATIONAL PROGRAMME 2003-2007

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Introduction

Bolivia is one of the poorest countries in Latin America. According to the last census, in 2007, the population of the country reached 9,837,365 inhabitants. 63% of the population is concentrated in urban areas and 38% in rural areas. 58,6% of the Bolivians are poor, they have below average income and low-levels of education.

Poverty is in part the consequence of the backward state of technology and education in the country but most of all it is due to the economic crisis that since 1998 has paralyzed the main productive sectors in the country, such as industry, agriculture, commerce and the construction industry, a sector that concentrates the greater part of the working population. The concentration of wealth in a few hands has always been another factor that has contributed to widen the poverty gap.

In 2000, the UN approved the implementation and setting in motion of 8 objectives, called the United Nations Millennium Development Goals, conceived to improving the living standards of poor countries. As stated in the 2007 Report of the United Nations, we are in fact moving forward in our efforts to meet the Millennium Development Goals but we are doing it at a snail's pace. This is not a surprise. In fact, this is something that had been anticipated because the training of teachers, engineers and technical staff takes a lot of time. The same happens in Bolivia where projects are moving forward little by little as it had been foreseen. In Bolivia, besides the efforts to advance, the projects had to face natural disasters, political conflicts aggravated since 2004 and the global economic crisis that affects mainly the poorest countries.

Working in Bolivia

In this scenario, Information and Communication Technologies have proved to be very effective to support socio-economic development in Bolivia and to move forward with the Millennium Development Goals, in particular with regard to the objective of eradicating extreme poverty and hunger (Objective 1), of achieving universal primary education (Objective 2) and creating a global partnership for development, particularly in good government activities. (Objective 8).

In 2000, IICD pledged its firm commitment to working and putting in a lot of effort in countries such as Bolivia, where ICTs and their application were still an unknown technology. The work started with a roundtable process to identify projects owned by institutions able to carry on the challenge of introducing ICTs in their working environment. IICD has developed a strategy work-country in order to support the whole process by sending experts to carry on with important phases of the projects. This was intended as a way to help partner organisations in the country understand and use ICTs for development. These phases we are referring to are: expert advice and strategic support, exchange of experiences, capacity development and monitoring and evaluation. In Bolivia, there are many organisations participating in the programme TicBolivia, sponsored by IICD, and their ICT for Development programmes have a very important role to play. TicBolivia promotes the use of ICTs in developing countries in order to help peasants, teachers, indigenous people and small agricultural producers gain access to communication and be informed. The

projects will enable people to improve their quality of life. IICD supports the implementation of ICTs in the nine departments of the country and in three sectors: good government, agriculture and education.

So far, this support has reached more than 626.614 beneficiaries in the 9 departments of the country and the total amount of direct users is about 155.720. All these people have gained access to a direct interaction with information technologies and services and have received training in the three sectors of the programme.

By means of its Monitoring and Evaluation System, IICD measures the satisfaction of the institutions and users with regard to the services received through the projects. Moreover, impact on final users is evaluated by means of indicators that show the degree of awareness, of empowerment, economic indicators and the impact on the sectors. The system includes the collection of questionnaires and feedback to the participants through the focal groups. This system has been applied since 2003, enabling a continuous 5 years evaluation of work with ICTs in Bolivia. During this period, 4.087 questionnaires were gathered, including 1.227 in 2007. This has facilitated the evaluation and has increased learning about the application of ICTs for development.

Summary of the projects participating in the programme TiCBolivia

Good Government Sector

1 Information about conflicts and negotiations on Indigenous Original Community Lands in Bolivia. (CIDOB)

To create a network to disseminate updated information about conflicts and negotiations and about the use of indigenous lands in Bolivia. This is possible thanks to ICT training provided to indigenous leaders, in particular women and through the strengthening of the nine regional centres at the national level.

2 Network of local radio producers ONDAS LIBRES (ICO, Casa de la Mujer and CIPCA)

To join the radio and the Internet to strengthen the impact and coverage of local radio programmes produced by several NGOs in Bolivia.

Education Sector

1 Ethnographic Materials in Multimedia Systems (APCOB)

To produce information in multimedia systems of ethnographic material focusing on educational activities for primary and secondary levels and for alternative education. To implement computer labs and training activities in 15 schools in the department of Santa Cruz.

2 Programme Chaski/Global teenagers (Fundación Ayni)

To set up computer labs, to provide training to teachers for the development of digital content, to enable virtual exchanges among students in 100 primary and secondary schools

3 TIC Bolivia Training Centre (EnBolivia.com)

To create a Training Institute in La Paz and Santa Cruz, to develop applications of new technologies

4. Computer Centres (CEPAC)

To set up computer labs, to provide training to teachers for the development of digital content in 15 primary and secondary schools.

5. National Programme of Educational Information Centres (Ministry of Education)

To provide assistance in the monitoring and evaluation of the impact attained by the Information Centres Programme and to train the employees of the Ministry

Agricultural Sector

1 Network of awareness raising with regard to ecological agriculture for peasant and indigenous communities (AOPEB)	To strengthen the network of information centres and leader agricultural producers in the 55 associations of ecological agricultural producers, members of the AOPEB. The overall objective of this network is to use the 15 information centres to raise awareness with regard to ecological agriculture and food safety.
2 Network of ICTs for Small Indigenous Agricultural Producers in the Chiquitano Region (APCOB)	To strengthen the position of small indigenous agricultural producers and their local and regional organisations in the Chiquitano area by enabling access to ICTs and combining the actions of the telecentres in 4 municipalities, local radios and VHF/UHF radios.
3 Chuquisaca System for Market Information (ACLO)	To create a network of information centres to provide information about marketing and prices to agricultural producers in the Department of Chuquisaca, joining the rural radio and a network of information centres in 10 municipalities.
4 Information System for Technological Innovation and Competitiveness of Small Agricultural Producers (CEPAC)	To set up a network of 6 information centres and a rural radio to improve production systems in small productive units run by peasant families and to facilitate marketing processes in the producers associations.
5 Information System for the follow up of public investments in the agricultural sector (CIOEC)	ICTs, available in 10 regional information centres, enable small farmers to take a better advantage of the opportunities of public investment in the agricultural sector as they give them the possibility to identify opportunities and funds available at the national level
6 System of Information and Agricultural Monitoring in the Valleys of Santa Cruz (ICO/CAPA)	To create an information and communication system by using information centres and the rural radio for the monitoring and information of farming activity in the valleys of Santa Cruz in three provinces: Mairana, Comarapa and Valle Grande.
7 Agriecological training with interactive tools (FUNDACION AGRECOL)	The integration of digital and interactive tools into the methodology From Peasant to Peasant, being used at the national level.
8 System of Information and Commercial Expert Advice for Agricultural Producers (CEPROBOL)	To use an on line information system regarding exports and e-commerce at the national and international level to increase and diversify agricultural exports and contribute to the socio-economic development of Bolivia.
9 Digital System of Geographic Information for Producers.(EL CEIBO)	Digital systematization of the internal processes of control for the certification of organic products in compliance with the external certification requirements used by the European Union, the United States of America and the International Federation of Organic Agriculture in the Department of La Paz.
10 Agricultural Information and Communication System (Prefectura Santa Cruz)	To set up an agricultural information and communication system for producers in the 15 provinces of the Department of Santa Cruz. To launch the project with a pilot in two provinces: Vallegrande and Guarayos

Satisfaction and impact among the users

The opinion of a representative sample of the users of all the projects in the programme was collected, in order to know about their satisfaction and about the impact of the projects on the target group. During the last 5 years (2003 – 2007), 4,089 questionnaires have been collected among the 155,000 users of the programme. The importance of this sample allows us to rely on the results that we have included in this report.

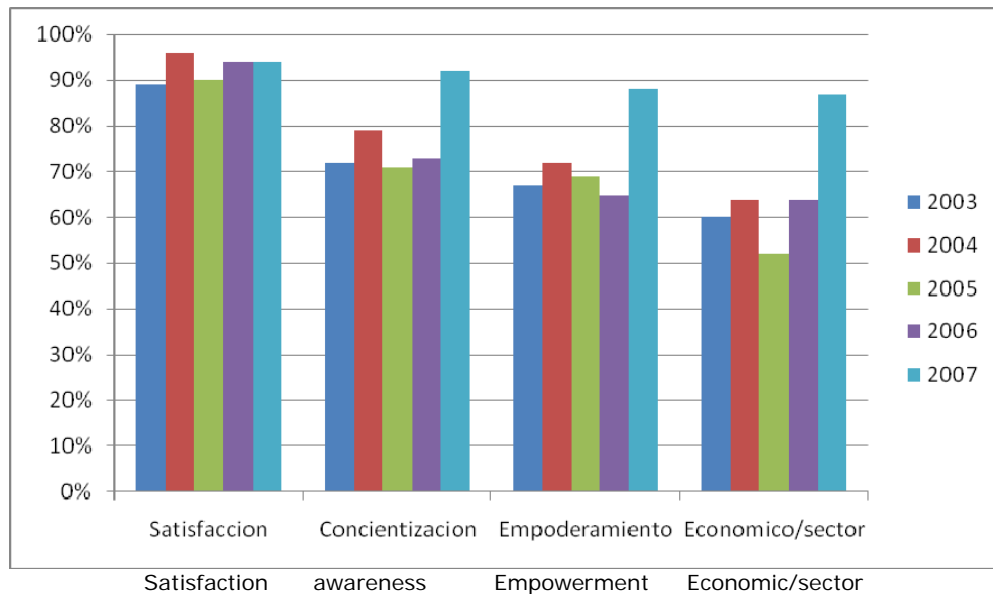
The positive impact of the assimilation of ICTs in the work of the participating institutions has been proved from the very beginning of the projects. The indicators measuring awareness and empowerment were the first to stand out in the on line surveys answered by the projects users. On the contrary, economic and sector indicators were initially quite low but they have improved with the years. The sustainability of the projects remains a big challenge as this can only be attained through the work and involvement of the whole community.

Good Government

There are two projects working in this sector, Confederación de Pueblos Indígenas del Oriente de Bolivia – CIDOB and Casa de la Mujer. The CIDOB project aims to achieve institutional strengthening for the protection of indigenous peoples' rights over lands. The Project of Casa de la Mujer works for the empowerment of women in urban areas.

In the good government sector, we have collected the opinions of 64 users of the ICT projects supported by IICD and run by Confederación de Pueblos Indígenas de Bolivia, CIDOB, and Casa de la Mujer. According to the opinions of the users, these are the observations and lessons learned in the sector:

- According to statistics, participation in rural areas is good. All the users have low levels of education and income. 54% of them live in rural areas and 44% of the users only have primary education. 58% of them earn a below average income.
- As in previous years, 90% of the users of CIDOB and Casa de la Mujer are satisfied with ICT services and information received. Projects help people in need, people with no access to computers or the Internet. Information centres turned out to be very advantageous for them as they offered them an opportunity to get trained and to manage information using either traditional tools like the radio or modern tools like the Internet.
- Satisfaction regarding the projects is confirmed by the impressive increase of awareness and empowerment levels in 2007. The same happens with economic impact and with the specific impact obtained in indicators of the good governance sector, such as efficiency, effectiveness and transparency in information (see the following chart).



- Indigenous people living in the departments where CIDOB is implementing ICTs have benefited with the availability of these tools as they are now more connected and better informed. ICTs have helped them keep their communities informed about their natural resources, their original lands and about political problems that affect their lives. Being well informed has enabled them to take timely decisions and to protect their interests.
- CIDOB has worked in the implementation of ICTs since 2000, and its project has achieved a huge impact that grows year after year. In 2007, satisfaction levels were even more important because of the training provided to the users. Awareness level reached almost 90% of the users that now see ICTs as a real essential and acknowledge that they cannot do without these tools any more.
- CIDOB users claim for more training sessions and for more access and connectivity. During these 7 years of joint work, many efforts have been done to provide support and to reach even the farthest corners of the communities in order to make access to information available for all.
- The number of women participating has increased from 35% to 44% in 2007. But there is still a minority of women participating in the projects in spite of the fact that there is an explicit demand for women to work with ICTs. The low participation of women in training activities may be



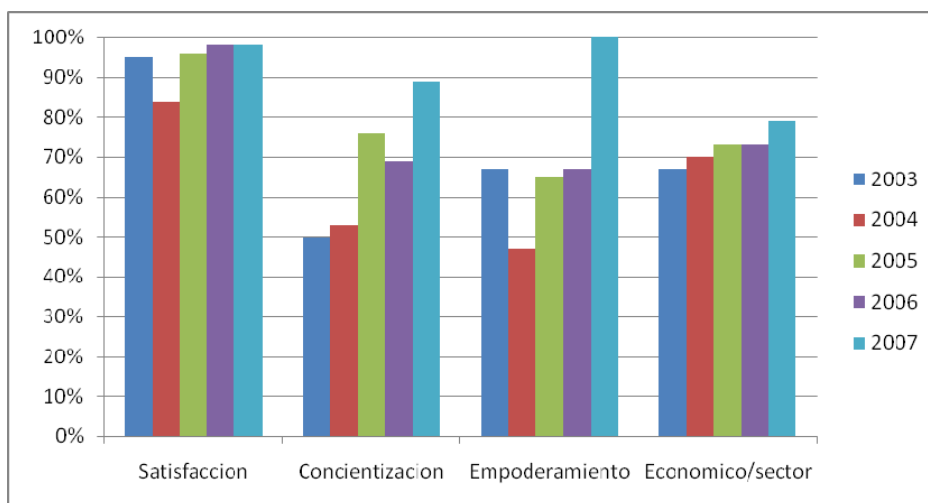
the problem that hinders their active participation in the projects. Indigenous women in particular ask for more participation but for that, they have to be trained. To face this challenge CIDOB has decided to focus on the launching of a project in 2008, supported by IICD, and specifically oriented towards the empowerment of women to be ICT leaders.

- For the users of Casa de la Mujer, the possibility to use the Internet and the web site are extremely important. Men and women declare to be satisfied with the information about development and gender equity, issues that are disseminated through the radio and the web page. Women that listen to the radio and use the virtual lab to make their consultations declare to be very satisfied: *"thanks to this project we know about our situation as women in society and about our rights to preserve our interests and mainly our physical, moral and economic integrity"*. 90% of the women that declared to be satisfied ask for the actions to be continued and for the dissemination of information at the national level.
- But, according to the users of Casa de la Mujer, the use of the Internet and the web site is still quite complicated. Thus, they keep asking for more training in the use of ICTs as they want to express themselves and make their opinions be heard. They assure that *"putting other women stories on the radio and on the Internet has motivated many women to break the silence."*
- During 7 years of work, both projects have succeeded in promoting an exchange of experiences and knowledge. This has enabled the projects to keep moving forward and to improve day after day with the purpose of meeting the objectives of the target group.

Education

In the sector of education, the projects of APCOB, AYNi and CEPAC were implemented. These projects focus mainly on the assimilation of ICTs in the classrooms and on the development of digital content for primary and secondary education. Their overall objective is to improve the quality of teaching and learning processes. The focus group includes school authorities, parents, teachers and students. These are the main lessons learned:

- In this sector, there is a good balance between women and men participating. And schools participating in the projects are located in rural areas and peri-urban sectors of low-income people.
- 95% of the beneficiaries declare to be satisfied with the training and the support received during the implementation phase of the programmes in their schools. They all agree that the use of ICTs is a positive element in learning processes and that as long as they are used in an appropriate way, they contribute to improve the quality of education.
- As regards economic impact, school authorities, teachers and students declare to be satisfied with their access to digital technology as they feel that *“the use of computers will help them to be connected with the world and will give them more opportunities to find a good job and thus improve their living standards.”*
- The impact attained shows clearly the important role played by ICTs in improving the quality of education, one of the most important indicators in the sector. The main reason that pushed the teachers to work with ICTs was the desire to learn more and at the same time to facilitate the learning process for their students.



Satisfaction Awareness Empowerment Economic/sector

- Taking the specific case of APCOB, it turned out that the users showed an interest to communicate with the world, with other peoples and other cultures. The ethnographic audiovisual material used by APCOB has helped the students recover the culture of the different peoples in the Oriente Boliviano (Eastern regions of the country). Teachers affirm that: *"thanks to the digital material prepared by the projects working in the area of education, students have become aware of the situation of indigenous peoples and this has contributed to generate respect in the students. Being more respectful has taught them to be more tolerant and to condemn racism."*

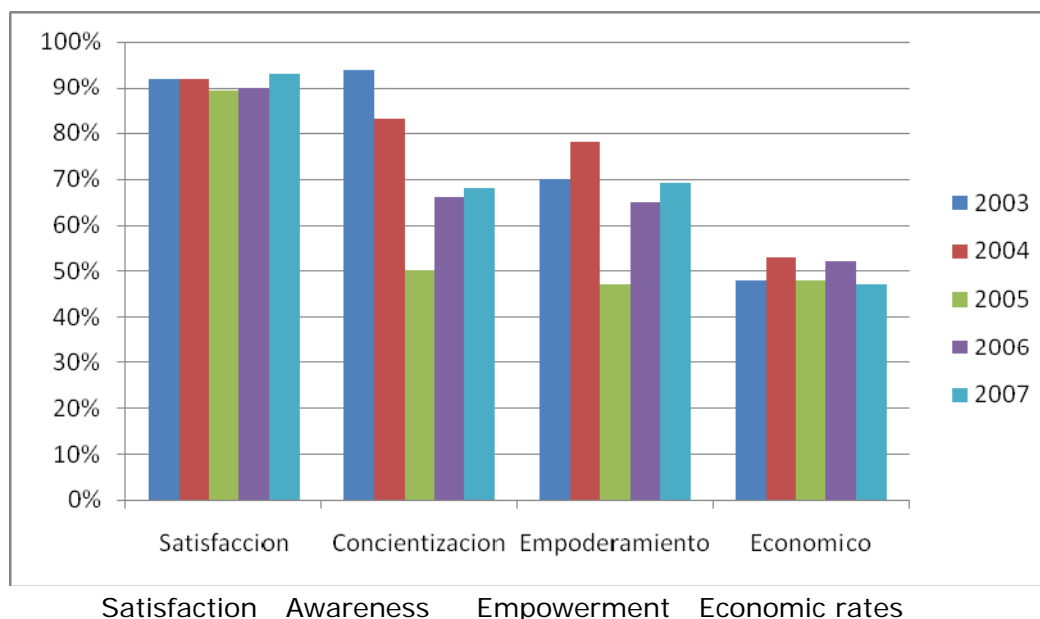


- Moreover, and thanks to the implementation of the projects and the methodologies used by AYNI and CEPAC, teachers and students are now able to improve the performance of their educational activities and turn them more effective and efficient. The project stands as a new challenge for them and to overcome all the obstacles they count on the support of the SEDUCAS at the local level. Teachers are aware of the fact that the application of ICTs in the learning and teaching processes has been a big step forward: *"students are more motivated and they develop their own learning materials. They are not afraid of using computers any more, they feel confident and the trainings have empowered them."* (The picture shows a didactic game developed by teachers with the support of AYNI).
- For other teachers, thanks to ICTs in the classroom, students have gained the capacity to contextualize contents in the learning processes: *"the process of learning and sharing contents becomes pleasant when performed by means of didactic and interactive games. And this is something novel and original for the students."* For their part, students affirm that the use of the Internet has enabled them to get in touch with other cultures and with other educational institutions. Here, a testimony of a student: *"the access, use and management of ICTs, in particular the computer was something amazing. We felt that when we learnt how to work with a computer we had accomplished our first goal."*
- But there are also demands that still need to be satisfied. Teachers claim the implementation of ICTs in every educational institution in Bolivia. Thus, they are asking for more support and follow up so as to be able to keep moving forward. They are asking for more computers to facilitate the learning processes of the students and they want to rely on an improved Internet access to be able to conduct their own researches and support the ones of the students.

Agriculture

From the agricultural sector, the participants are the users of the projects implemented by AGRECOL, AOPEB, APCOB and ICO. In all of them, actions are focused on the access and exchange of information about market prices, about supply and demand variations in the markets and on agricultural production techniques. Particular emphasis is placed on the availability of information and on the access of small producers in rural areas to relevant communication tools. The most important lessons in this sector can be summarized as follows:

- The results show that the efforts made by the project teams are in fact oriented toward offering guidance and support to small and medium-scale agricultural producers, haunted by poverty and hunger. According to these results, the projects have succeeded in their efforts to help small producers with very low income (50%) or with an average income (46%). The majority of them (94%) live in rural areas.
- Economic indicators show that rates were lower in 2007 than in 2006. A possible explanation for this decrease can be found in the effect of the current political, social and economic crisis that is affecting the country and that has had an enormous impact on the sector. On the other hand, political instability and environmental problems have compelled technicians to reduce their support to the producers and this has resulted in a lack of motivation, in fewer training opportunities and less communication for the provision of effective support to the producers.



- Like in any other sector, users in the agricultural sector have benefited from training opportunities according to their particular needs. 73% of the users declare to be very satisfied with the quality of the training received. Technical support is particularly important for self development and, when asked about the project staff, 68% of them affirm to be very satisfied. To bear witness to this satisfaction, here is a statement of an

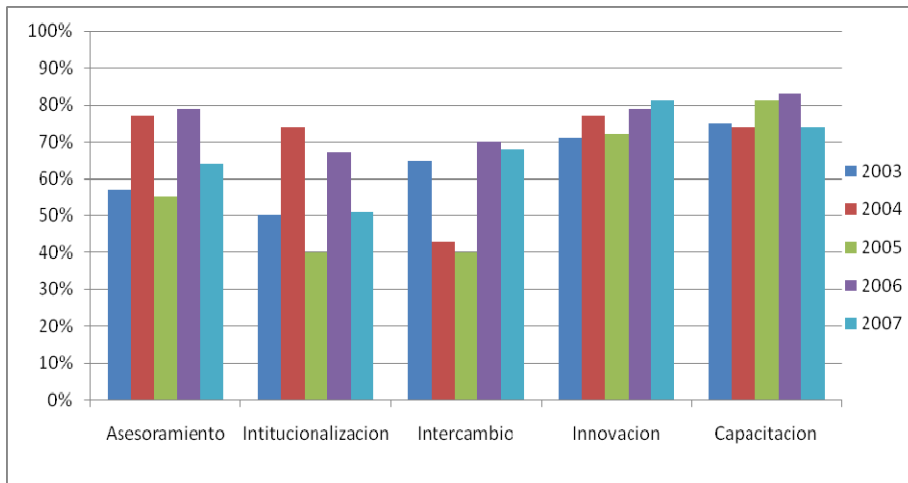
AGRECOL project user: *"In the past, I didn't have photos or experiences to show to anybody. Now I carry them everywhere in my computer and I can show them to other producers' families. With our cameras we take pictures to provide evidence for our bio indicators and to show to others how to fight against the plagues that damage our crops. Currently I am putting the documentation of experiences into practice and I use this material when I go somewhere else to exchange experiences with other agricultural producers."*

- Projects provide for the development of a series of information services available to the users. 93% of them declare to be very satisfied with these services as the projects have enabled them to meet their objectives. Information about prices, about national and international markets and about new production techniques that have showed them how to become more productive are some of the services obtained through the Internet, through VHF/UHF radios, the local radio, the telephone, etc. A user of the AOPEB project affirmed: *"Thanks to this ICT project of AOPEB we were finally able to get fair prices, we learnt about standard practices concerning ecological production, APAEY gained access to the Internet and we have currently more and better perspectives"*. Another user, from CEPAC stated: *"Now I have a better access to information, more time to communicate with others and I get all this at a lower cost."*
- Nevertheless, a high percentage of the users are not satisfied with the Internet service. Up to now, access has been very problematic and communication very limited. The Internet has not reached the communities yet, despite the efforts made by the projects. Connectivity costs are very high and impossible to sustain. And the users ask for the project technical staff to make more visits and follow up activities.
- There is still a shortcoming that needs to be corrected and it is the participation of women in the projects. Only 30% of the users are women. This problem remains a very important challenge for the Bolivian programme.

Evaluation of the support received from IICD

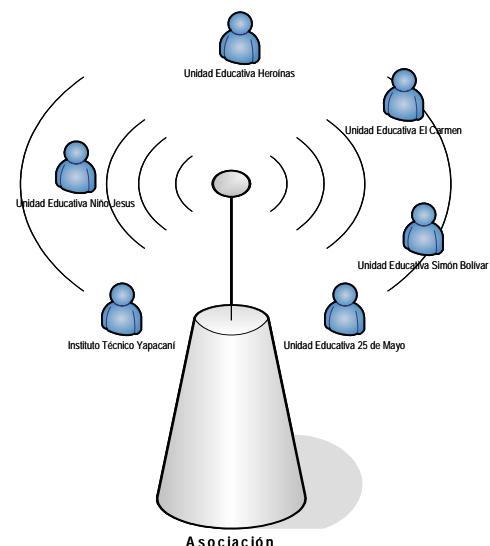
The members of the project teams are interviewed once in a year, in order to assess their satisfaction concerning the support received from IICD. In 2007, 32 project team members representing almost all the projects responded to the questionnaires. Regarding the support offered by IICD, the following are the most important observations:

- An average of 78% of the project team members are satisfied with the **expert advice** offered by IICD during the last 6 years. In 2007 satisfaction levels dropped to 64%. The explanation for this is that in 2007 IICD reduced its expert advice to the projects.



Expert advice Institutionalisation Exchange Innovation Training

- The conclusion reached by the members of the project teams is that IICD support remains a crucial element, very important to keep on moving forward. They assure that strategic expert advice has to be maintained as well as the search for joint solutions but that, at the same time, they need to be more communicated. Problems of continuity, connectivity and access are still to be worked out.
- During the last two years, the IICD has provided indirect support to the projects through its expert advice on **technological innovations** and through **training** provided to users and project members. These activities were coordinated by Edgar Arandia and Sherman Chavez. For the technological innovation and the training the starting point was the development of a plan that measured the needs of the institutions, the degree of knowledge of the users and the distances to be covered. An example of this is the wireless network that CEPAC installed in Yapacani (see chart). Satisfaction levels are high.



Institutions managed to get a clear idea picture as regards the use of ICT tools and the users felt satisfied because the trainings reached their communities.

- Among other results, we can observe the **institutionalization** of projects in the institutions where they have been implemented but this has still to be improved. The members of the projects say that they have faced many problems during the phases of the implementation and they assure that if they had the possibility to have more participation in the discussions and in the internal decision making processes they could achieve better results and with less effort. The project leaders lack of a smooth communication among them and with the members of the project teams. As regards this, degrees of satisfaction have always been very erratic and this is an aspect that deserves to be taken into consideration and has to be discussed in the institutions. In 2007 levels of satisfaction fell to 51% if compared to the 67% reached in 2006.
- The **exchange of experiences** has been enabled by the Network TIC Bolivia that was created precisely to meet this objective. The network enables the exchange of experiences among the different institutions working with ICTs for Development in Bolivia. Indicators show a good satisfaction level and the relationship among institutions is very good, as it was in previous years.

Training Programme

In 2007, training reached 180 people in 17 courses in the following institutions: CIDOB, CASA de la MUJER, AOPEB, AYNI, APCOB AGRICOLA; CEPROBOL, ACLO, CEPROEST WIÑAY, El CEIBO and the Ministry of Education. This training programme was partially funded by IICD and by the participating organisations. The coordination of the courses was the responsibility of Edgar Arandia, with the help of Sherman Chavez and the participation of several training institutions.

Subject matters were diverse, including technical issues and others dealing with the administration. Attention was focused particularly on the management and up keeping of the information centres operated by the users of the projects, a key element for the sustainability of the programme. Here are some of the lessons learned about the training programme:

- In 2007 more than 180 members of the projects and users were trained, according to their specific needs. 70% of them were final users. Trainings were implemented and made available for the rest of the communities. The fact of taking the trainings to the communities meant a cost reduction for the institutions and the identification of users' capacities made the learning easier. This was also of great help to put the knowledge acquired into practice. Trainings were an important step forward for the work in Bolivia as after being trained users and/or beneficiaries were able to gain access to technology and, by that, improve their quality of life.
- An appropriate gender balance was attained as the training programmes reached men (53%) and women (47%). And this thanks to the efforts made by trainers and project members that never stopped to emphasize the importance of reaching gender balance in the training sessions.
- During the trainings, participants were enabled to develop their own materials, as it was the case of the users of CEIBO that learned to use geographical information systems and to draw their own maps for products like coffee or cocoa beans. APCOB is another example. The technician of APCOB went to Brazil to get training on satellite networks. This enabled him to make his work more efficient and to attain the sustainability of connectivity in his organisation.

Training Courses in 2007*

Adobe Audition - Several
Administration of Information Centres - CIDOB
Administration of Information Centres (Advanced) - CIDOB
Administration of Information Centres - APCOB
Administration of Information Centres – Ministry of Education
Network Technologies – Ministry of Education
Virtual Consulting Service - Casa de la Mujer
Pedagogical Content – Ministry of Education
Satellite Networks - Several
SIG – Several
SIG (Advanced) – CEPAC, el CEIBO
Wireless Networks – Ministry of Education
MESH Networks Sucre - Several
Technical Workshops for Information Centres Managers - Several
Workshop Community Radios - APCOB
Workshop Offimatics - ACLO
Wits/Trains - CEPROBOL
* Several: course with the participation of several organisations

General Suggestions

When analyzing and summarizing opinions and trends appearing in the demands of users and members of the technical teams of the projects during the last five years, these are the demands most frequently repeated:

Demands coming from the users:

- To increase follow up actions from the technical teams to the information centres
- To continue and extend training activities for the users
- To provide more computers and equipment to increase access to direct information for the users
- To facilitate access to a high quality Internet connectivity and at affordable prices

Demands from the project teams:

- To continue the support for technological innovation
- To organize periodic meetings to promote exchanges
- To provide support to obtain more funding in order to enlarge the project coverage and to include more beneficiaries
- To be more in touch with IICD