

First Draft

# Rural connectivity for development: Experiences from Ecuador

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# Content

Introduction.....	2
1. Remote Wireless Connectivity: the case of MCCH .....	3
1.1 Background .....	3
1.2 Implementation .....	3
1.3 Applied Technology.....	3
1.4 Funding and economic sustainability .....	4
1.5 Lessons learned .....	4
2. Connectivity and micro financing: the case of Acción Rural .....	5
2.1 Background .....	5
2.2 Implementation .....	5
2.3 Applied Technology.....	5
2.4 Economic Sustainability.....	6
2.5 Lessons learned .....	6
3. Connected Information Centres: the case of CAMARI-FEPP Guamote - Tixán .....	7
3.1 Background .....	7
3.2 Implementation .....	7
3.3 Applied Technology.....	7
3.4 Economic Sustainability.....	7
3.5 Testimony – P. Julio Gortaire .....	8
3.6 Lessons learned .....	8
4. Having a bearing on regulation: the case of the Workshop on Community Wireless Networks.....	9
4.1 Background .....	9
4.2 Implementation .....	9
4.3 Results .....	9
4.4 Lessons learned .....	10
5. Fair trade and connectivity: the case of CAMARI-FEPP Salinas .....	11
5.1 Background .....	11
5.2 Implementation .....	11
5.3 Applied Technology.....	11
5.4 Funding and economic sustainability .....	12
5.5 Testimony – Padre Antonio Polo .....	12
5.6 Lessons learned .....	12
6. Sustainability models: the case of Business Plans CAMARI .....	13
6.1 Background .....	13
6.2 Implementation .....	13
6.3 Lessons learned .....	14
7. Advice for a Sustainability Strategy, Contents and Social Use of Information Centres: the case of SENPLADES .....	15
7.1 Background .....	15
7.2 Implementation: Sustainability models.....	15
7.3 Implementation: A network of actors and contents.....	17
7.4 Implementation: Capacity development program .....	17
7.5 Lessons learned .....	19
8. Conclusions and Best Practices .....	20

# Introduction

The Rural Connectivity Programme in Ecuador was inspired by the work that the International Institute for Communication and Development (IICD) has undertaken in Bolivia since 2003. The first case study on the experiences with Wireless Community Networks in Bolivia was carried out in 2006.

IICD's rural connectivity programme in Ecuador started in 2005. The goal of this report is to share experiences, analyze the implementation, describe the technology used and share best practices and lessons learned.

The experiences in Ecuador shown here are:

1. Remote wireless connectivity: MCCH case study
2. Connectivity and micro-financing: Acción Rural case study
3. Connected Information centres: CAMARI-FEPP Guamote and Tixán case study
4. Impact regulation: Workshop on Community Wireless Networks
5. Fair Trade and connectivity: CAMARI-FEPP Salinas de Guaranda case study
6. Sustainability Models: Business Plans CAMARI-FEPP case study
7. Advice for a Sustainability Strategy, Contents and Social Use of Tele-centres: SENPLADES case study

All the experiences are related, they share practices, they are somehow linked, but most of all, all projects are inspired by the dream of turning connectivity into a tool able to bring about radical changes for the rural areas in Ecuador.

# 1. Remote Wireless Connectivity: the case of MCCH

## 1.1 Background

Fundación Maquita Cushunchic Comercializando como Hermanos (MCCH) is a non profit organisation that started in 1985, from an initiative of Comunidades Eclesiales de Base del Sur de Quito (Grassroots Ecclesiastical Communities in the South of Quito) and Youth Groups, to work in the area of marketing for low income communities in the country.

MCCH promotes the creation of Community Purchase Centres (CACs) as an alternative way of selling produce, avoiding middlemen and promoting fair weight and prices. This project is focused on strengthening the national labour union network of cocoa producers, by introducing a communication scheme to enable a useful information flow for all the entities participating in the cocoa production process. The project also tries to increase control and management of price information useful for the decision making in production and marketing.

The MCCH project was located in the province of Esmeraldas and it focused on linking four villages: Quinindé, Las Golondrinas, Viche and Agua Fria. Before the project started the only way to get reliable sales information in each CAC was to gather it personally, which was very time consuming.

## 1.2 Implementation

Each CAC was equipped with computers using the managerial information system developed for the project. The main challenge to tackle was interconnecting the CACs. The centres in Quito and Guayaquil got their Internet connection through ADSL, while Esmeraldas had a dial-up connection. In addition, the four CACs in Esmeraldas were successfully linked by means of a system of short wave radio, as information was generated in places where - at the moment - there was no other connectivity option.

After testing short wave technologies it was possible to establish connections between places more than 350 Km apart. Nevertheless, the speed was hardly more than 3 Kbps, which was not enough to get reliable voice and data transmission.

Connectivity was tested by means of a mobile unit connected to the headquarters in Esmeraldas. The first tests from Quinindé, some 100 Km away, were successful. During the testing it was even possible to get communication from Guayaquil.

Nevertheless, as short wave technology is based on the reflection of the waves in the ionosphere, this solution is highly dependent on unpredictable factors like solar activity, the weather and other factors.

The tests were conducted between July and September 2005. At the moment, in the area where the CACs are located, mobile phones are already available and so the best solution to send messages or have voice communication is now the use of mobile phones.



## 1.3 Applied Technology

For connectivity the following technologies were used:

- From Esmeraldas: Dial-up connection
- From Quito: ADSL (128 Kbps)
- Guayaquil: ADSL (64 Kbps)
- Between the 4 CACs and Esmeraldas communication by short wave radio of 3 Kbps (at present mobile phones are already being used)

For testing connectivity by means of short wave radios, the frequencies used were within the range of 3 to 30 MHz. It was decided not to use channels of more than 3KHz. This enabled speeds up to 5.6 Kbps in ideal conditions, using Q15X35 software packages on a Linux platform.

In the case of distances of more than 350 Km it was possible to obtain a no IP data transmission speed of 3 Kbps and a DRM voice transmission of 3.5 Kbps. Working over this distance, transmissions using Q15X25 did not work due to some software errors.

Almost throughout the whole country the possibility to implement remote links by means of short wave technology was tested. In this case it was not possible to establish connectivity as planned. At the moment, mobile phones are being used as they have proven to be the cheapest and easiest way for communication.

## 1.4 Funding and economic sustainability

IICD took over the financial support of the project, covering the total amount of USD 70,000.

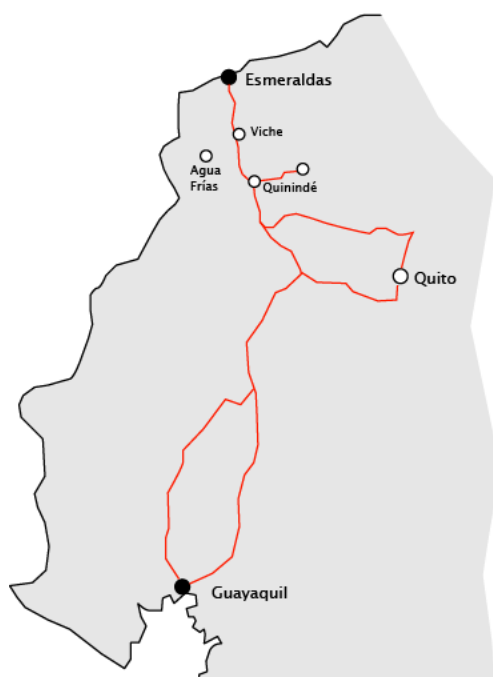
## 1.5 Lessons learned

The main achievements of the project were:

- A managerial information system was at the disposal of the CACs which increased efficiency.
- Although short wave technology is available, in terms of cost and quality the implementation of it is not justified.

The challenges to overcome were:

- The biggest challenge was to harmonize the financial/management system in use: it was too sophisticated and heavy, with a Network access environment.
- The system needed connections of at least 64 Kbps and the connection speeds hardly attained 3 Kbps.
- It was assumed that an output of 1bps/Hz with the use of more sophisticated modulation methods would enable to reach up to 3bps/Hz.
- The use of low frequencies is not convenient as they demand bigger size antennae.
- Radios broadcasting with frequencies that use the ionosphere depend on many different factors which can not be controlled. That makes this type of technology a bad option for data transmission.



## 2. Connectivity and micro financing: the case of Acción Rural

### 2.1 Background

This project is the result of the merging of several efforts. Tim Anten and Jan Middelburg, students at de Technical University (TU) of Delft and Erasmus University of Rotterdam, and IICD agreed to embark on the project "Eradication of poverty through micro financing and telecommunications". This project started in April 2006 and the organisations Acción Rural and Camari were selected to start up the project.

The project concentrated on the provinces of Chimborazo and Tungurahua where all the agencies of the Acción Rural cooperative were to be interconnected and provided with Internet connection. The main goal was to enable the cooperative to increase its financial services and to lower transaction costs. At the same time the implementers wanted to guarantee the sustainability of the project over time.

In order to create synergies and make proper use of the resources the network was shared with Camari, an organisation devoted to fair trade marketing. The case of Camari is the subject of a separate analysis.

### 2.2 Implementation

The implementation of the project was carried out by Postal Portals, Oftelsat and Acción Rural. Postal Portals performed an engineering study into the best alternatives for the implementation process, to be able to determine the means of transmission, the number of repeating sites and how many towers were needed, their size and location, the distance between repeating sites, the choice for equipment to address the needs, the import of that equipment, the provision of electric power, the hiring of a telephone line and ADSL for Ambato, traffic analysis and everything else needed to make the project a success..

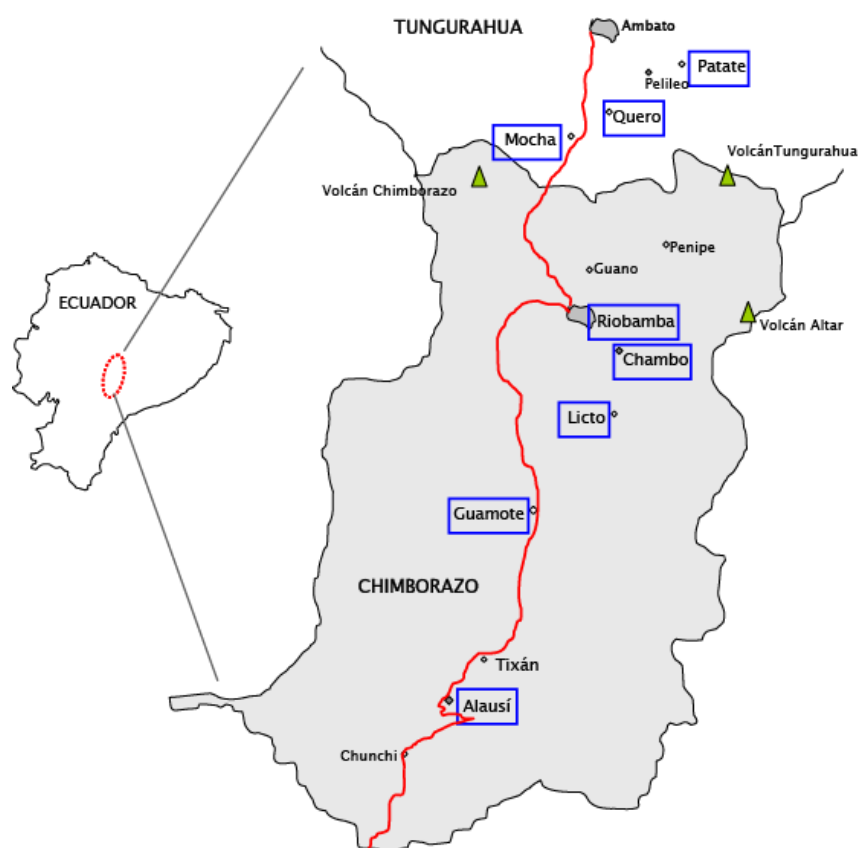
Oftelsat, a local company with more than eight years of experience, was in charge of the configuration of the network, putting it into operation and maintaining the equipment. In addition they are the people responsible for the operation of the wireless network.

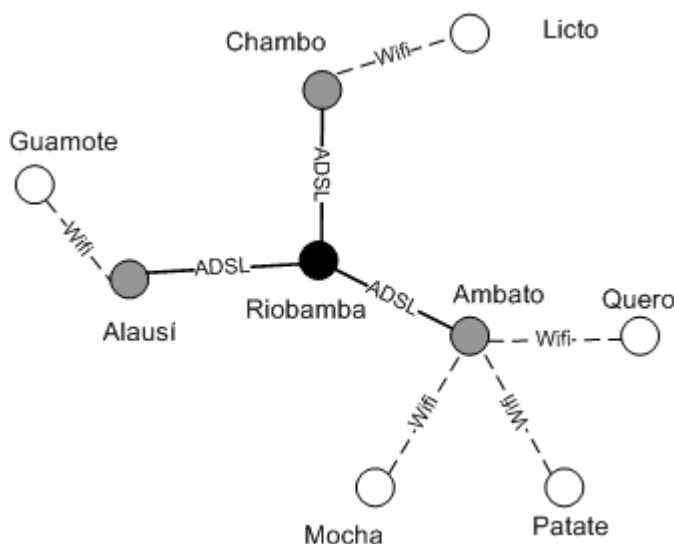
For its part, Acción Rural, which is the beneficiary of the project, has taken over the management of the network. For this reason, it will be necessary to provide training to a member of the cooperative so as to enable him to configure, maintain and manage the network. This will enable the cooperative to work independently from Oftelsat and to cut down expenses. In order to provide connection among locations, a wireless connection was built, putting up towers on top of the principal hills. The locations are shown in the picture. The installation was done by Tim and Jan, with the support of Oftelsat.

The offices of Acción Rural that have been linked through radio frequency are: Riobamba, Quero, Patate, Guamote, Alausi, Mocha, Chambo and Licto.

### 2.3 Applied Technology

As it has already been said, this is a mixed network, sharing radio frequency and ADSL links and interconnecting all the operational offices of the cooperative Acción Rural (8 points).





Connectivity in the locations is possible through ADSL connection (provided by Andinatel), and using WIFI wireless technology to broadcast the signal to remote locations. ADSL accesses are 512/256 Kbps and their cost is USD 99. For its part WIFI is a protocol (802.11g) able to connect remote points (up to 70 kilometers in experimental conditions) at a high speed (maximum 54 Mbps). The channels operate in a frequency of 2.4 GHz and thus they are not interfered by rain or clouds. Final users make use of an antenna of 24dB to cover a distance of up to 10 Km. The speed of the links is 5 Mbps, quick enough to guarantee communication among rural offices of Acción Rural and Camari. Besides, the network enables Internet connection for educational purposes for additional locations such as information centres.

Even if the capacity of the wireless network is high, ADSL links are of 512 Kbps and this turned into a bottle neck. Because of this, the Administration of the Cooperative has decided to allocate resources for the total linking through radio frequency. The project was

allocated to the company Oftelsat as part of the third stage of the project. In this way, the Cooperative has now all its offices totally connected through radio links since February 2008, except the office in Riobamba Centro that still has an ADSL connection.

## 2.4 Economic Sustainability

This pilot project was funded by the students with the support of Acción rural, Camari, Oxfam Novib, Fundación Rabobank and the Universities TU Delft and Erasmus. The total amount of the project was about USD 60,000. The operational costs are paid by the different branches of the Cooperative.

## 2.5 Lessons learned

Concerning the achievements, we can mention the following:

- Availability of improved data communication
- Inclusion of new internal services such as telephones and IP cameras
- Inclusion of new external services such as ATMs, shared windows and remittances
- Improvement of bandwidth, speed and delays.
- Independence from the ADSL provider
- From the start up phase and during its implementation, the project was greatly focused on technology. When the project was set in motion, the lack of a sustainability plan and of a business plan was evident.

The main obstacles that the project had to overcome were:

- Problems with the Customs to get the equipment
- Difficult access to repeating sites
- Internet configuration for the wireless links.
- Purchase or leasing of repeating sites
- Installation of electric power in the hills, too much paper work and big delays for installation
- Time consuming procedures to obtain the permits from the regulation committee (SENATEL)
- Community networks have to follow procedures of a private network (many problems and high costs). This has been one of the reasons for the creation of a discussion process regarding the desired status of community wireless networks.
- As a consequence of the lack of a business plan there were many administrative and economic problems. It was never considered who would take care of maintenance costs or who would be in charge of coordinating the system, what would happen when damaged equipment had to be replaced, among other things. This was because all these issues were not considered during project formulation.
- The implementation of this project shows how difficult it is to improvise business issues after the equipment has been installed. The best and advisable thing to do is to solve these problems before starting implementation.

# 3. Connected Information Centres: the case of CAMARI -FEPP Guamote - Tixán

## 3.1 Background

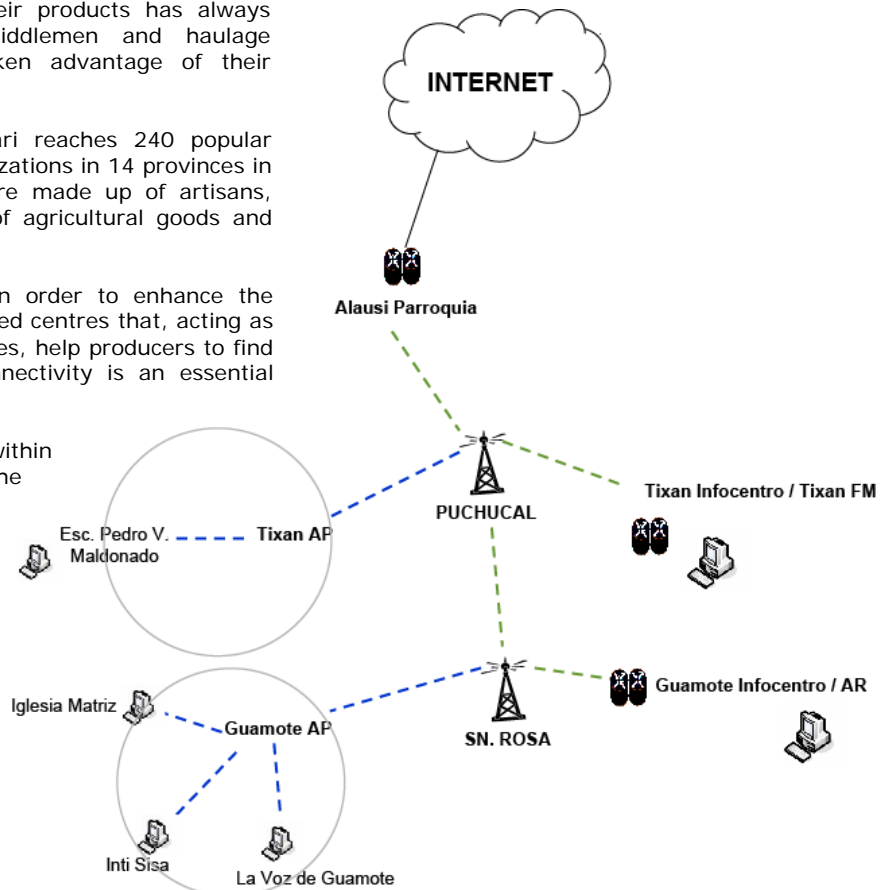
One of the most important activities carried out by FEPP is marketing through Camari. This activity was included since 1981 as another institutional line of action as it had been understood that an enhanced production through training, credit and technical assistance was not enough. Something had to be done to confront the “bottleneck” of marketing.

For small producers, marketing their products has always been a problem as traders, middlemen and haulage contractors have at all times taken advantage of their inferiority situation.

With its marketing services, Camari reaches 240 popular grassroots and second degree organizations in 14 provinces in the country. These organizations are made up of artisans, mainly women, and by producers of agricultural goods and processed products.

With the assistance of IICD and in order to enhance the marketing process, Camari has created centres that, acting as information and communication offices, help producers to find new markets. For this reason, connectivity is an essential issue for these information centres.

This connectivity project was born within the approach of improving the resources identified during the implementation of a communication system for the cooperative Acción Rural. As soon as the coverage area of the micro financing system had been identified, it was easy to appoint the information centres in Guamote and Tixán as the probable beneficiaries of connectivity, associated to the project for Acción Rural.



## 3.2 Implementation

The implementation was part of the Acción Rural project, where Postal Portals and Oftelsat were crucial actors.

Through this communication system not only information centres gained connectivity and were enabled to disseminate the price of the products on a regular basis but also educational institutions, the town church, a hotel and the radio could benefit from connection.

In this way, the school Pedro Vicente Maldonado in Tixán has permanent Internet access and its students can now get in touch with global knowledge. For its part, the Hotel Inti Sisa has included as a value added service for its guests the possibility of Internet access and, at the same time, it makes good use of electronic marketing to promote the hotel services. The radio station La Voz de Guamote, makes a particular use of Internet access, as it can now download radio content in digital format.

Recently, an Internet café in the city of Guamote and an information centre of the Coordinadora Agroecológica Ecuatoriana CEA have linked to this community network.

## 3.3 Applied Technology

The project uses mixed technology. In the city of Alausí the access to an ADSL channel is available thanks to the infrastructure of the branch of the Cooperative Acción rural in that city. Tixán and Guamote, as shown in the picture, are connected through radio frequency links. A band of 2.4 GHz is used for this. In both cities, “access points” were installed to enable wireless connectivity for several organizations.

## 3.4 Economic Sustainability

The initial investment in infrastructure was a part of the cooperative Acción Rural project. The maintenance costs are shared among all the users. The main expense, shared with Acción Rural, is the monthly payment of USD 100 to Andinatel for the use of an ADSL line in Alausí.



### 3.5 Testimony – P. Julio Gortaire

*“The fact of having a broadband service coming from Alausí, has been of great help, not only for the activities of Radio Voz de Guamote and Fundación ACT but also because it has enabled us to help and give connectivity to the Fire Department and to the hospital. This has been a good change. But we have also had to overcome difficulties with the technological provider, mainly when we decided to take over the technical control. It seems that they didn't agree with that...but, in spite of that we are pretty well, we are doing our best to take care of technical issues by ourselves.”*

*The main challenge is to make the system more stable. There is a repeating site that sometimes has problems and loses connectivity. Once this inconvenient solved, we have to improve connectivity in the centre of the town, where it is possible to deliver more and better services. But the important thing remains to reach the most remote indigenous communities in order to give them the possibility to get connected to the Internet...”*

### 3.6 Lessons learned

The main achievements of the project are:

- The undeniable benefits that Internet access and broadband provide for marketing, education and business.
- The replacement of the old dial up connection, cutting down costs and increasing the quality of the service.
- The technological provider has allowed the organizations themselves to take care of the monitoring of the links. This has enabled the project partners to find quick solutions for simple problems.
- The idea of shaping an ICT micro company to serve the information centres is being considered, focusing on expanding the services to other sectors.
- By the middle of 2008 another three remote points will be connected to the system. This expansion is the result of community self-management. People seem to have discovered that communication brings about development opportunities.

Among the main challenges, we have to point out:

- One of the most important challenges was that as the project shared its expenses, it was not always clear how much to charge for the services. No business plan had been prepared to consider the different expenses like connection costs, the rent of the premises and the payments for the system manager.
- For the reason stated before a training program on business planning was developed in 7 villages. This experience is presented in the case “sustainability models: Business Plans CAMARI-FEPP”
- Organizations have to take on an enhanced leadership for network management.
- Monitoring and technical support have to be transferred little by little to the members of the organizations, as the cost of technological providers is often very expensive.
- Nevertheless, it is still necessary to strengthen the monitoring and technical support capacities of the user organizations network.
- The use of this network demands a private network permit. It was obtained by the cooperative Acción Rural for the operation of the 8 branches referred in the previous case. The lack of regulations concerning community networks creates ambiguity with regard to this kind of networks.

# 4. Having a bearing on regulation: the case of the Workshop on Community Wireless Networks

## 4.1 Background

As it has been shown in the cases of Acción Rural and Camari, broadband wireless connectivity is the future in the development of this technology, due to its possibilities of expansion, its coverage, etc.

The experience of IICD, shows that tele-centres sustainability could be based on a strategy implying the creation of wireless community networks. Nevertheless, all over the world and more specifically in Ecuador, there is very little or none regulation about the way of running this kind of networks. Meanwhile, these networks have to obtain permits from private networks that cost more than USD 3,000, including preliminary studies, taxes and other expenses. This requirement turns the fact of obtaining a license in something absolutely prohibitive, and opposite to the reality and goals of community networks.

Community networks should be considered a priority because they perform a social mission contributing to universalize the services of telecommunications and getting remote locations connected to information.

For this reason and with the purpose of discussing the challenges of these new technologies the workshop "Regulation of community wireless networks" was organized in December 2007.

## 4.2 Implementation

The main goal of this workshop was to discuss concrete proposals in order to adapt or to create specific regulations for the exploitation of community wireless networks. More specifically, the workshop tried to:

- Show the obstacles that have to be overcome when operating with wireless networks and the reality of regulations in force.
- Determine strategic lines of discussion.
- Define concrete proposals to modify or to add to the current wireless networks regulation.

Telecommunication experts were invited to participate. The workshop had an attendance of 20 to 30 people, among which there were:

- Officials of the regulating institutions: SENATEL, SUPTTEL, FODETEL
- Managers and employees of telecommunication companies
- Members of the civil society, users groups, foundations.

The workshop was divided in three stages:

- Contextualization: on the basis of a presentation, the current status of wireless networks regulations was exposed.
- Definition of discussion lines: using a brainstorming technique, people attending the workshop determined key issues for discussion.
- Proposals for regulation: through 5 groups of 3 to 5 members, participants discussed the principles for each strategic line pointed out during the previous stage.

## 4.3 Results

Once the workshop started, it was possible to verify that there was no consensus regarding the scope of a definition for community wireless networks. For this reason, a previous work had to be performed within each group. After the presentations of the input of each group in a plenary session, the facilitators proposed the following definition that must still be revised:

*"A **community network** is a telecommunications network managed by the organization that tries to share services or infrastructure for the fulfilment of development goals. They are networks qualified by Fodetel."*

With the purpose of gathering precise inputs, five strategic lines for discussion were defined. By means of group work, some principles and concerns were determined for each one of the strategic lines. Hereinafter, each one of these inputs:

Enabling title	<ul style="list-style-type: none"> <li>• Consider the idea of resale services</li> <li>• Create the title of value added community service, having the option to operate a community network</li> <li>• Create a regulation for "internet access", a final service that has been behind for a long time</li> <li>• Determine very clearly to whom it must be awarded: a legal or natural person duly qualified (legal representative)</li> <li>• What happens with the initial investment if there is new coverage?</li> </ul>
Frequencies	<ul style="list-style-type: none"> <li>• It is advisable to use the free bands: 2.4, y 5.x GHz. ICM applications.</li> <li>• Frequencies should be registered, but the process of registration should be simplified. Specifically the procedures related with the Comando Conjunto and the permits to operate a Private Network</li> <li>• Concerning the payment of the frequencies, no consensus was reached. There are two positions: <ul style="list-style-type: none"> <li>◦ To pay, as it is being done currently, but to reduce costs for community networks</li> <li>◦ Not to pay. The operation of community networks should be free.</li> </ul> </li> </ul>
Services	<ul style="list-style-type: none"> <li>• Services should not be limited</li> <li>• Services provided should be of good quality and be accompanied by a reliable support infrastructure</li> <li>• Services should always be available.</li> </ul>
Interconnection	<ul style="list-style-type: none"> <li>• To get connected to public networks</li> </ul>
Control	<ul style="list-style-type: none"> <li>• To be subject to quality standards</li> </ul>

#### 4.4 Lessons learned

The achievements of this initiative were:

- A debate was started concerning the status of community wireless networks and the challenges they have to overcome. Nevertheless, this was nothing but the first step.
- A participatory and multisectorial process was created in order to reform, to adjust or to create a special regulation for community networks.

On the other hand the challenges found were:

- No consensus was reached regarding a definition of a community wireless network and its scope. It is advisable to deepen the discussion, based on real experiences and cases.
- In order to have more elements for judgment, it is suggested to choose the more relevant cases of current implementations and to present them as testimonies for analysis.
- It would be very useful to have documents illustrating previous studies, comparative regulations or other analyses on the subject to provide more information to people attending future workshops.
- It was proposed to keep this debate alive by means of virtual platforms: forums, wikis, blogs, etc. so as to include new actors and make the debate more democratic. Inputs for these platforms could be very useful as topics of discussion for future workshops.
- The impact of this type of networks is so big that if this solution was implemented in each one of the access points that FODETEL intends to put up during the next years, the 1000 tele-centres could be transformed into 5000 internet access points.

# 5. Fair trade and connectivity: the case of CAMARI -FEPP Salinas

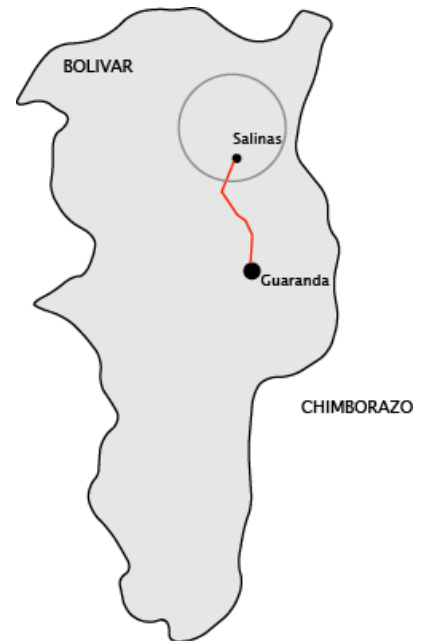
## 5.1 Background

Salinas is a parish in the canton Guaranda in the province of Bolivar, with a population of more or less 10,000 inhabitants among indigenous and mestizos (people of mixed race). It is located in the western foothills of the Andes, at an altitude of 3,600 meters and very close to the Chimborazo volcano. With its 30 grassroots communities, it has managed to give shape to community organizations and to create working opportunities in the villages, based on the principles of solidarity, equity, the protection of natural resources and the quality in production and in the provision of services.

In the 70s, the brand Salinerito was born. After several attempts, by the end of the 80s. the brand managed to reach the main markets in Ambato and Quito. At the same time, new productive initiatives began to appear such as new cheese factories, cold meat factories, sweets, infusions, dried mushrooms, and all types of handicrafts coming from other peasant organizations under the protection of the same branch. By the end of the 90s, the production started a huge diversification.

Currently, El Salinerito is working with community micro businesses all over the country, under the form of franchising production, establishing Sales Points and choosing and negotiating the best products and the most advantageous conditions with suppliers. It has several points of distribution for its products: cheese, chocolate, turrón (a type of candy traditionally eaten at Christmas), cold meat, infusions, dried mushrooms, etc. with registered trademark "Salinerito" and distributed in the main cities of the country and abroad.

Broadband Internet connection in the community of Salinas de Guaranda was the response to meet the need of improving negotiation and marketing conditions and to develop comprehensive education for children and young people in Salinas de Guaranda through a virtual classroom.



## 5.2 Implementation

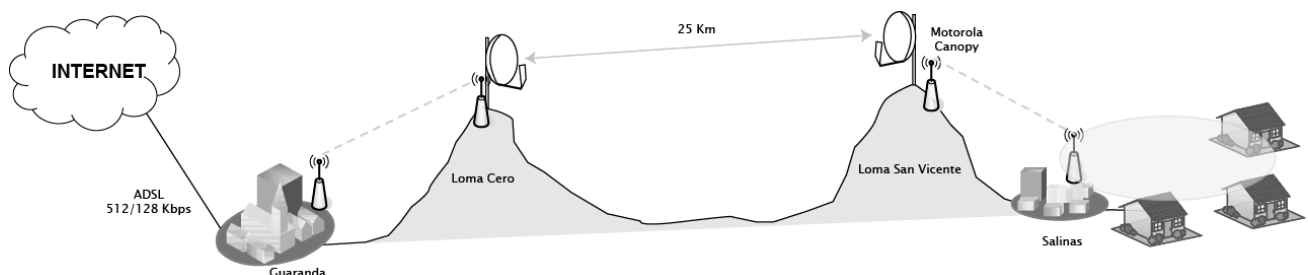
Communication is a vital tool for business, for education and for social communication. The community of Salinas did not have internet access and when somebody had to use it, it was necessary to travel to some of the nearby communities like Guaranda, Ambato or Riobamba. For this reason, many opportunities to strengthen the economy of the peasants were lost.

At the moment, Salinas counts on micro businesses that provide work as direct labour for almost 350 families and reach almost 10,000 people among producers and people in the community indirectly related to them. Concerning education, the town has a kindergarten, a primary school and a High School. Parents and organizations in the town have managed to set up a small computers lab even if they still lack of Internet access.

The connectivity project consisted in hiring an ADSL access in the city of Guaranda and taking it to the community of Salinas, using a wireless link and sharing the signal through an "access point".

Currently, they have a communication channel with a speed of 512/128 Kbps that arrives by wireless connectivity to 8 remote points in the community of Salinas de Guaranda.

## 5.3 Applied Technology



As it was already mentioned, an ADSL connection was implemented from the city of Guaranda to the community of Salinas with a bandwidth of 512/128 Kbps. At the same time, 8 peasant organizations and a virtual classroom gained connectivity through wireless system.

The technology used is an ADSL access hired from Andinatel in the city of Guaranda, starting from there by means of a wireless link as shown in the picture. A Motorola Canopy was used working in the 2.4 GHz band.

#### 5.4 Funding and economic sustainability

The cost of the project amounted to USD 18,000 and was funded by IICD. The monthly fees to pay for Internet access are shared among the 8 peasant organizations beneficiaries of the service.

#### 5.5 Testimony – Padre Antonio Polo

*“Here in the province we started to export when there was no connectivity and nobody had mobile phones like now. We saw that the Army had put up a relay station on top of the Calvary hill, very close to our church, so, we decided to install an antenna, we hanged a cable and in that simple way, we started to be connected. Just imagine a village that exports and cannot communicate...for those who want to produce and sell, connectivity is like the air to breathe. But, through connectivity, we also want to send a message of justice and accountability.*

*But many things have still to be done; we would like to create a network to link all the cooperatives in order to create a network of rural finances. Also, we want to help teachers by connecting all our schools. As you see there is an aspect of commercial use and economic development but there is also another educational, social, and pastoral aspect”.*

#### 5.6 Lessons learned

The main achievements are:

- An improved communication for business. Currently the 8 organizations have broadband Internet access.
- A virtual classroom where students can gain access to the resources available on the Internet.
- The previous satellite communication, used by some organizations was replaced as it was too expensive.
- Real business opportunities were created.

The main obstacles were:

- The procedures for the legalization of the network. They are very complicated and are currently still being accomplished
- There is no person in charge of the coordination of the network
- There is not a 100% of security concerning the quality of the service. Signal keeps cutting off sometimes and thus the service is not available.

# 6. Sustainability models: the case of Business Plans CAMARI

## 6.1 Background

With the idea of creating sustainability models for tele-centres, it was proposed to formulate business plans in 7 towns of the central mountain range: Cusubamba, San Gabriel, Tixán, Guamote, Salinas, Sigchos, and Simiatug. The development of business plans was performed in three stages:

- Training and capacity development for the drawing up of business plans
- Assistance during the process
- Final formulation of the plans by stakeholders

Hereinafter, the main lessons learned are shared.

## 6.2 Implementation

At the beginning the workshop assistants participated independently with their proposals for business plans, guessing about the services and features of the plans as they had not previously worked in common with the members of their communities

ICT projects with a community base are more likely to succeed and to become sustainable. Somehow, the community manages to organize itself, it distributes the costs, the burdens, and it exploits the advantages of ICTs to its own profit. Even if this does not happen every time, there is a long maturing period where community leaders and also the leaders of external organizations make huge and constant efforts until finally new behaviours are generated thanks to the ICTs.

The project will work as long as the appointed people manage to turn themselves into leaders among the members of their communities.

Many communities are interested and they contribute with the premises and some other resources in kind, but yet, they have to be determined to work with the financial issues if they want the ICT office or the tele-centre work properly. For example, in one of them, there was a delay of 5 months in the payment for connectivity and nobody bothered to pay until the service was cut off.

Micro enterprises that have settled near the services in the area are a combination of local ventures, flexibility, creativity and low cost labour as well as intelligent use of available technological resources. And this means a lot of work for the organizations and their leaders. Without huge efforts there are no successful projects.

People attending the workshop do not have a profile of strong leadership as they depend on their organizations, and their ideas do not necessarily coincide with those of the organization they represent. Moreover, they are subject to the political ups and downs of the organizations and thus, they cannot guarantee the continuity of the projects.

The projects will reach sustainability only if they are strongly rooted in a socio-cultural context of the community. This can be achieved through participation in the community, starting from the very beginning of the project, combining local differences and peculiarities according to the goals they share and creating a sort of empathy with the community. Social sustainability is possible if the community feels that it has been empowered by the project and if it assumes this empowerment as a common asset.

In the business plans, we have a context of high costs and low income, a low population density for the services and no information whatsoever about their priorities or their disposition to pay for the services. Moreover, there is a serious lack of complementary infrastructure, such as electricity supply. This is, by the way, one of the big problems of the projects.

To express the project in market terms, always bearing in mind the business plan, has its disadvantages as the project has a social goal. We must not forget the areas of development. The market approach compels the projects to compete with similar initiatives, like Internet cafes or telephone booths including services of net surfing and similar activities.

Precisely, the long maturing period demanded by this kind of project forces us to think very well before choosing the strategy to work with the communities in each area. A constant work has to be done for motivation, training and commitment, mainly with the leaders. After all, the resources and efforts coming from Camari have a limit. As it has already been said many times, projects cannot depend on people that have participated in the workshops. The success of the projects depends on the organizations. High level boards of directors have to be created in each locality with decision making capacities and the possibility of mobilizing resources, including financial resources to support the ICT office, the information centre or the tele-centre.

### 6.3 Lessons learned

From what the participants have done so far, the following conclusions can be drawn:

- The construction of the projects is understood as a process of two stages. The active participation of the beneficiaries of the community and the generation of networks for collaboration and contents. The first stage is not finished yet.
- the lack of leadership in communities, even among the ruling groups in the communities involved with the project. With no social empowerment of the project in each community, the possibilities of success are very few.
- Nothing happens when technology is available but there are no incentives to use it. Supply does not generate an automatic demand. Because of that a lot of work has to be done to make these new ideas become rooted in the community.
- And even more time will be necessary in order to reach sustainability. First we have to become aware of its social impact and then we will be able to verify its financial sustainability.

# 7. Advice for a Sustainability Strategy, Contents and Social Use of Information Centres: the case of SENPLADES

## 7.1 Background

The National Bureau for Planning and Development (SENPLADES) is carrying out the Project of Modernization of Electricity, Telecommunications and Rural Development Sectors, PROMEC, that wants to pave the way for poverty alleviation, human development and for the economic growth of Ecuador through: the strengthening of regulatory bodies and the improvement of environmental management; the promotion of efficiency in the use of energy; the extension of telecommunications and electricity supply to areas where there are no services and finally, communication, consultation and participation activities.

The PROMEC project, in line with its subsection Multipurpose Community Centres has designed stage 2 of the implementation, called "Sustainability Strategy, Contents and Social Use". With this, SENPLADES-PROMEC, as responsible of the strategy of execution, gives support to the start up phase of the 1120 tele-centres and its operation by asking actors coming from the public, private and civil society sectors to be a part of the process.

The purpose of IICd's technical assistance was the development of three strategies. The generation of sustainability models, the creation of a network of actors able to generate content and the definition of a capacity development program.

## 7.2 Implementation: Sustainability models

The goal of this component was the identification of certain key issues for the sustainability of the tele-centres. For that, we will start by listing some of the features and goals that tele-centres should have:

- First of all, they should be an instrument for the strengthening of community organization
- They should enable the development of a collective intelligence
- They build up individual capacities
- They contribute to employment and micro business
- They contribute to improve health and education
- They revitalize community participation
- They offer new sources of knowledge
- They facilitate communication and the spreading of culture
- They produce positive externalities
- They have a social profitability
- They contribute to poverty alleviation

Nevertheless, these desired goals are threatened by a complex reality. We must bear in mind that people are interested in earning their living and that for that they do the best they can. Besides, people promote the things that are in their area of control. Some media have more bearing on their lives than others and so, to make incursions into technology means sometimes unbalance people's lives and this is something difficult to accept. But, on the other hand, the learning process helps people to see the differences. Knowledge helps them to distinguish that not everything they see is homogeneous or different or strange. Quite the opposite, things and facts can be recognized, familiarized, personalized and this can change practices and even discourses. This is the reason why the first thing to consider is economic development and the aspirations of people regarding their lives. In the second place, their capacity to understand and figure out a structural fitting together with new technologies. Finally, we can think about technologies and the possible combinations we can do with them. Thus, our conclusion is that the best tele-centres are those that create value for the promotion of intelligence and autonomy.

The strategy of the sustainability model presented here is based on the development of a business plan. Even if it is possible to make good deals without having a business plan, if we have one, our possibilities of success will rise. Besides it is a good letter of introduction vis-à-vis potential sponsors. These are the benefits of a business plan for a tele-centre:

- It is a guide to start and operate the tele-centre.
- It explains to the partners and founding members why the tele-centre needs their input.
- It is used to raise funds for the tele-centre.
- It is used as a source document for the staff and volunteers.

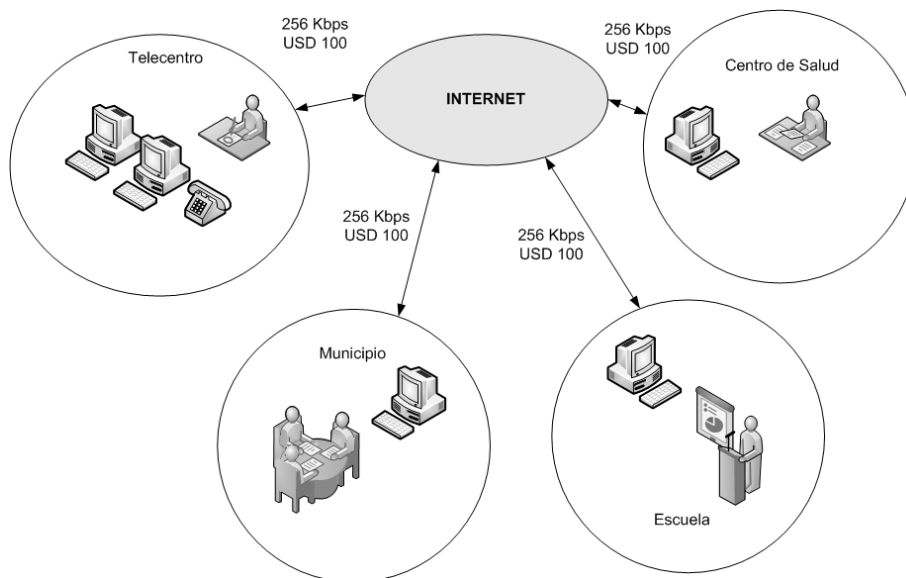


The steps for the development of a business plan are:

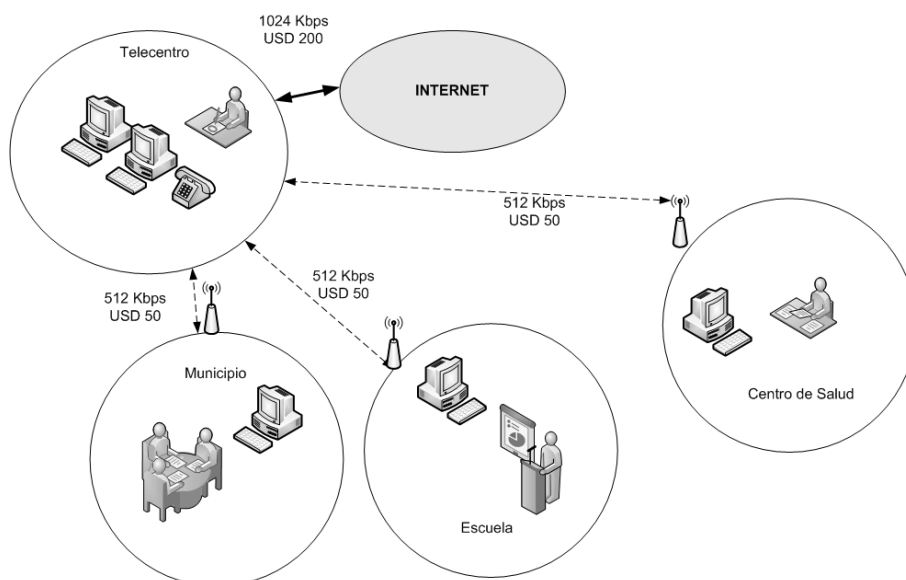
- Definition of a team for the promotion
- Definition of the degree of commitment
- Definition of the values and the main purpose
- Definition of the type of tele-centre and of the services
- Market analysis
- Marketing
- Service production
- Installation and maintenance of technology and equipments
- Organization and control
- FODA analysis
- Solution of financial aspects
- Taking into account legal matters
- Risks and contingency plan

The key issues in the sustainability of tele-centres are:

- Networking of the tele-centres.
- The creation of a network that relies on principles and values
- These principles and values enable a powerful learning environment
- And the sharing of experiences
- With community leadership
- Looking for autonomy
- The key issue is an interdisciplinary approach
- Based on community wireless networks



***Traditional model of community access***



**Model of access based on community wireless networks**

### 7.3 Implementation: A network of actors and contents

The sustainability model considers the strategy of creating a network of actors related to the tele-centres as a matter of vital importance, not only because networking is very fashionable but due to its evident benefits.

But, why a network of actors and contents? This question can have many answers as the word “network” has several meanings. But bearing in mind the importance that tele-centres have in our country, we could say that these networks are the “New knowledge factories of 21st. century”. These networks are helping people to be a part of Information Society, they are assisting people in their efforts to keep technologically connected and overcome the “digital gap”.

When we speak about tele-centre networks, we generally think about infrastructure, about a huge amount of computer equipment, installed in premises with quick Internet connections together with other Information and Communication Technologies. And this vision hides what tele-centres really are, that is to say a human team that with great difficulty manages to introduce ICTs in the lives of thousands of people. They are efficient as long as they manage to enable citizens to find what they are looking for, to improve what they already have and to offer them the things they need.

The content for tele-centres is centred in a portal. This web site helps in the management of content. For that it is advisable:

- Comply with quality standards: HTML, CSS, XML, etc.
- Meet use and access standards
- Make use of network tools such as web 2.0: Wikis, blogs, RSS
- Define an information strategy, based on the users needs.
- Decentralize content management, through a CMS and define users' profiles, access levels, etc.

The sustainability of the network is a key factor. For this, it is advisable to share the initial inversion among the government, other public institutions and international cooperation. Self- sustainability models based on membership fees, service sales and subsidies could be tested in order to provide for operation and maintenance expenses.

In order to carry out this strategy and define its feasibility, the following actions are suggested:

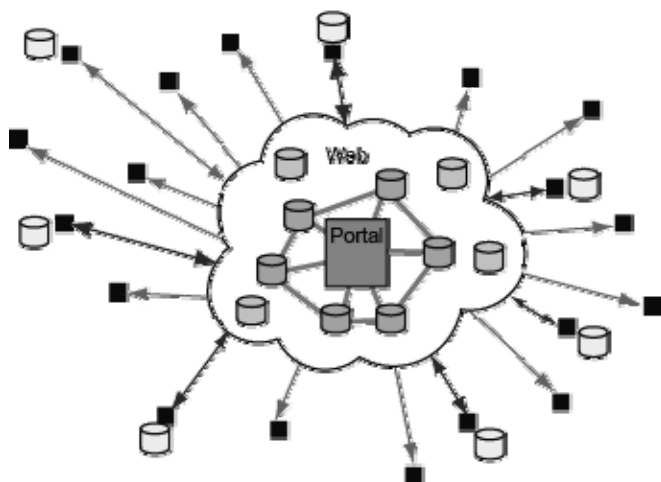
- To draw up a business plan
- To organize meetings among the actors
- To define mechanisms for coordination
- To create the portal [www.telecentros.ec](http://www.telecentros.ec)
- To start with the generation of a conducive environment for exchanges

### 7.4 Implementation: Capacity development program

Telecentres are considered as change agents as they make an important contribution to reduce digital gap and to promote economical, social, cultural and political development in the communities. Therefore, tele-centre managers play the role of facilitators for ICT supported development.

The profile of a tele-centre administrator has to guarantee at least:

- A High School Degree
- The reference and support of a local community organization regarding his/her commitment and responsibility
- Evidences of his/her commitment with learning and skills for knowledge transmission
- Knowledge concerning the local environment and about the main social actors



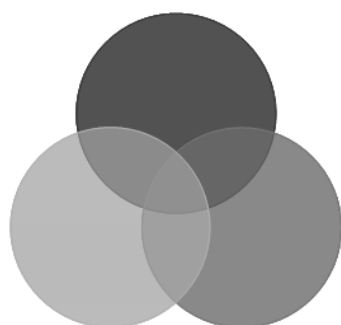
■ Telecentro

Staff selection procedure:

- A committee representing the community will be appointed to carry over the process of selection. This process has to be public and clear
- Applicants will be evaluated by means of interviews and inquiries to the community
- applications introduced by women, ethnic minorities and handicapped people will be the subject of special consideration, to guarantee equal opportunities.

**Promotores del  
aprovechamiento de  
las TIC.**

**Multiplicadores  
de destrezas  
TIC.**



**Gestionan técnica y  
administrativamente el  
telecentro.**

### ***The roles of Tele-centre managers***

Promoting ICTs and inducing communities to make good use of them

- They identify the needs and requirements of different social actors in the community in order to suggest the use of appropriate tools and the access/production of content.
- This is a key component to help the community gain ownership of the tele-centre and its social sustainability

Multiplication of ICT Skills

- The managers will act as technological mediators, and will see to the replication of technical skills for a better use of ICTs.
- Therefore, they will try to help the users make an effective and autonomous use of these tools and skills.

Administrative and technical management of the information centres

- The managers will be responsible for the basic administrative and financial management of the tele-centre. They will also have to inform about the course of action and running of activities for the evaluation of its performance.
- They will also be in charge of the technical management, the correct operation of the centre, the maintenance and monitoring of services and equipment

The training should be based on adult education methodologies. Training should always start from the context of participants and respond to their needs. Adults carry with them their previous experiences and thus they approach training according to their particularities and specific expectations.

## 7.5 Lessons learned

At the time of writing this report, the project PROMEC is suspended. After the setting up of 50% of the planned tele-centres, some contractual and regulatory issues still need to be defined. Nevertheless, IICD has presented the result of its planned advisory service to the SENPLADES. The achievements obtained as a result of the development of this strategy are:

- The proposal of a sustainability model based on the elaboration of business plans, weighing up a previous process of socialization, as a crucial element for tele-centre ownership.
- Economic sustainability is mainly based on the use of community wireless networks.
- Networking is inevitable; therefore, tele-centres should be part of a network. The generation of content is more efficient if it is done through collaboration and coordination.
- Capacity development among tele-centre managers will determine the level in which ICTs are used and their appropriation by communities. This is the reason why the profile of tele-centre managers and their process of selection must guarantee that they can assume a role of facilitators in order to help the development of the community.

## 8. Conclusions and Best Practices

The implementation of the projects that have been described has enabled us to come to the following conclusions. They can be considered as best practices and be used as input and matter of discussion for future rural connectivity projects.

### Challenges of Technology

- Unlike access in the cities, rural connectivity has to overcome huge obstacles mainly due to the lack of basic infrastructure such as electricity supply, availability of telephone lines, let alone Internet access. This calls for enhanced creativity when the time comes to propose communication solutions.
- Wireless solutions seem to be the ones offering more benefits. Nevertheless, the investment demanded by the implementation of its infrastructure is extremely high (towers, antennae, solar panels, etc.). Therefore, we feel compelled to evaluate in the first place other available wireless technologies such as ADSL and to combine them, creating mixed solutions leading to more affordable systems.
- Even if the range of wireless solutions is very wide, WiFi technology, using the frequency 2.4 GHz has proved to be the more stable, even in remote communications. Besides, the availability of equipments and its low cost make the choice of this technology the more appropriate for rural systems.
- There are short wave wireless technologies that have proved to work properly over big distances. However, the lack of an appropriate speed in the links and the instability of communication due to atmospheric and solar conditions, determine these technologies to be considered unfeasible.
- Beyond these questions of technological viability of some type of communication solution, it is important to determine the sustainability mechanisms to enable the project to subsist. In other way, project implementers may have a hard time to find the money to cover operational costs. If these costs are not paid, there is risk of losing the investment in initial infrastructure, which is usually very high.

### Sustainability model

- The main reason for the development of a business plan is that it enables us to have an idea how the implementation will be, how high the costs, the possible charges and the definition of an operational plan
- A business approach is important for the creation of sustainability models. However, another key factor is to understand that connectivity projects for development work according to a social approach. First of all, they have to take into account the needs of people in the communities and the potential benefits created by the use of ICTs.
- It seems that the most important input that generates a process of ICTs appropriation in rural areas is the leadership of people in the community.
- The administration of a social or technological network demands at least a minimum organization, so as to coordinate efforts to find the better way of keeping technology in operation and of fostering a permanent research about the different uses of ICTs in organizations and communities.
- The cases described are mainly centred in the uses that connectivity may have in the area of micro financing, socially responsible marketing or decision making processes. Nevertheless, it is also important to point out the benefits in the areas of education, community tourism and agriculture.
- A scheme of collaboration within the community would be a solid model of sustainability, where the responsibility for the maintenance and operation of the process would be shared among several actors. In this model there are three key issues: wireless technologies, leadership and enabling legislation.

### Regulatory Framework

- A constant difficulty to obtain the permits for the operation of wireless networks. On the one hand, the process requires a study performed by a team of expert technicians and on the other hand, the formalities required are usually long and very difficult.
- Besides the difficulties with application formalities, permits and registrations, the legislation does not consider the existence of networks of community nature, and this fact leaves only two options for operation: the first option is to operate as a private network, but this is not always possible according to the reality of organizations. And the second is to start operating without any kind of enabling title, compelling these networks to work on the fringes of the law.
- It is therefore very urgent to have a particular legislation enabling community wireless networks to spread out in order to make these solutions reach remote locations in rural areas.

# IICD Profile

With the right tools, people in developing countries can considerably improve their livelihoods and quality of life. Better access to information and communication technology (ICT) is particularly vital in enabling them to achieve their goals. This is why the International Institute for Communication and Development (IICD) creates practical and sustainable solutions that connect people and enable them to benefit from ICT. As an independent not-for-profit foundation, we put knowledge, innovation and finance to work with partners from the public, private and not-for profit sectors. Together, we can make a world of difference.

IICD is active in Africa, Latin-America and the Caribbean, where we create and enhance development opportunities in education, good governance, livelihoods, health and the environment. Our approach includes linking local, national and international organisations as well as formulating and implementing ICT-supported development policies and projects.

IICD was established by the Netherlands Ministry of Foreign Affairs in 1996. Our core funders include the Dutch Directorate-General for Development Cooperation (DGIS), the UK Department for International Development (DFID) and the Swiss Agency for Development and Cooperation (SDC). For more information, please visit [www.iicd.org](http://www.iicd.org).

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