



# Global Information Society Watch

## 2018



**IDRC | CRDI**

**Canada**<sup>ca</sup>

International Development Research Centre  
Centre de recherches pour le développement international

**Operational team**

Roxana Bassi (APC)  
Valeria Betancourt (APC)  
Kathleen Diga (APC)  
Alan Finlay (APC)  
Michael Jensen (APC)  
Carlos Rey-Moreno (APC)

**APC project coordination team**

Namita Aavriti (APC)  
Roxana Bassi (APC)  
Valeria Betancourt (APC)  
Kathleen Diga (APC)  
Anriette Esterhuysen (APC)  
Flavia Fascendini (APC)  
Alan Finlay (APC)  
Chat Garcia Ramilo (APC)  
Michael Jensen (APC)  
Carlos Rey-Moreno (APC)

**GISWatch 2018 advisory committee**

Carlos Baca (REDES)  
Luca Belli (FGV)  
Jane Coffin (ISOC)  
Kazanka Comfort (Fantsuam Foundation)  
Stéphane Couture (York University)  
Alison Gillwald (Research ICT Africa)  
Michuki Mwangi (ISOC)  
Leandro Navarro (PANGEA)  
Dorothy Okello (WOUGNET/Makerere University)  
Nico Pace (AlterMundi)  
Steve Song (Village Telco/Rhizomatica)  
Ritu Srivastava (DEF)

**Project coordinator**

Kathleen Diga / Roxana Bassi (APC)

**Editor**

Alan Finlay

**Assistant editor and proofreading**

Lori Nordstrom (APC)

**Publication production support**

Cathy Chen

**Graphic design**

Monocromo  
info@monocromo.com.uy  
Phone: +598 2400 1685

**Cover illustration**

Matías Bervejillo

This work was carried out with the aid of a grant from the International Development Research Centre (IDRC), Ottawa, Canada, as part of the APC project “Community access networks: How to connect the next billion to the Internet”. More information at: <https://www.apc.org/en/project/local-access-networks-can-unconnected-connect-themselves>  
The views expressed herein do not necessarily represent those of IDRC or its Board of Governors.



**IDRC | CRDI**

**Canada**

International Development Research Centre  
Centre de recherches pour le développement international

Financial support provided by



*This edition of GISWatch came into being alongside a brand new baby boy. Welcome to the world, Ronan Diga!*

Published by APC  
2018

Printed in USA

Creative Commons Attribution 4.0 International (CC BY 4.0)  
<https://creativecommons.org/licenses/by/4.0/>  
Some rights reserved.

Global Information Society Watch 2018 web and e-book  
ISBN 978-92-95113-06-0  
APC-201810-CIPP-R-EN-DIGITAL-296

Disclaimer: The views expressed in the introduction, thematic and country reports of GISWatch are not necessarily the views of APC or of its members.



Anonymous<sup>1</sup>

### Introduction

In this report we describe the process of creating a community network in our rural community of about 50 people. In order to support the creation of more community networks in Ecuador, we also look at the legal and regulatory context and the relationship between technological possibility and community, political and economic will.

In early 2017 we started a community network and now there is growing interest from various communities across the country, especially farming and indigenous communities, and those that participate in second- and third-level organisations (i.e. unions of communities and confederations of unions).

At the time of writing this report in mid-2018, we are upgrading our internet connection, expanding our physical infrastructure and beginning a more organised learning process. At the national level, the communications law is undergoing reform, and the first whispers of a community network coalition are emerging, inspired by other experiences in Latin America. People are looking to us for support about how to create networks here, since we appear to be the first such network in Ecuador.<sup>2</sup> This report serves as a snapshot of this moment from our perspective, which is only one of many perspectives.

### Policy, economic and political background

Rapid changes in public policy, law and regulations during the past 10 years have left an uncertain field of action. The laws can be interpreted as favourable to community networks, even though community networks are absent from the regulations.<sup>3</sup> At the same time, the economic situation

makes the creation of community networks viable though not trivial.

In Ecuador there are laws in favour of community communications but no policies specifically addressing community networks. We have also not found detailed analyses of the country's internet or spectrum regulation from the perspective of community networks, although a very useful spectrum analysis from 2011 still seems relevant even though laws have changed.<sup>4</sup> A government presentation from 2008 recommended four regulatory alternatives to strengthen community networks, but they were not implemented as far as we know.<sup>5</sup>

As mentioned in GISWatch 2017,<sup>6</sup> the development of the internet in Ecuador has favoured the private sector, especially multinational corporations, with some focus on the public sector, and very little functional influence from civil society, or the "community" sector as it is sometimes called in

1 The author of this report chose to remain anonymous, and APC respected this choice as it is consistent with its privacy and security standards.

2 Based on the description of community networks in the Declaration on Community Connectivity in Belli, L. (Ed.). (2017). *Community networks: the Internet by the people, for the people. Official outcome of the UN IGF Dynamic Coalition on Community Connectivity*. [https://www.intgovforum.org/multilingual/index.php?q=filedepot\\_download/4391/1132](https://www.intgovforum.org/multilingual/index.php?q=filedepot_download/4391/1132)

3 Interview with Valeria Betancourt, manager of the APC Communications and Information Policy Programme.

4 The case study notes (translation ours): "Another possibility would be to start processes of direct action based on the application of constitutional rights, and only later have these recognised by the courts. For example, start to use the spectrum without applying for a licence, [...] using the spectrum for broadband projects and then requesting protective measures from judges for these initiatives. It is important, in any case, to develop technically strong propositions, search for allies in the political push for legal reform, and fight so that the reform is debated widely and transparently. The possibilities of achieving democratic reforms are high. However, at the same time, it is possible that the debate will remain in the circles of influence of private companies, especially the big operators, and trapped in technical discourse, in which case there is also the possibility that constitutional rights will end up neutralised in the legal reforms." Navas Alvear, M. (2011). *Espectro abierto para el desarrollo – Estudio de caso: Ecuador*. Johannesburg: APC. [https://www.apc.org/sites/default/files/Espectro\\_Ecuador\\_o.pdf](https://www.apc.org/sites/default/files/Espectro_Ecuador_o.pdf)

5 Fiallos, J. C. (2008). *Redes Comunitarias*. Slide show by an employee of CONATEL (former state telecommunication regulatory agency, replaced by ARCOTEL) who later became Sub-Secretary of Development of the Information Society and Online Government. It is a useful analysis of the legal and regulatory situation at that time and offers sound planning advice. It does not demonstrate an understanding of the characteristics of community networks as described by the Dynamic Coalition on Community Connectivity. Slide 25 is of interest – it seems that none of these suggestions for regulatory alternatives to strengthen community networks was implemented. The slides were presented as part of a training programme by IMAGINAR and IICD called Technical Update Seminars. [https://www.imaginar.org/iicd/index\\_archivos/TUS12/7\\_Redex\\_FODETEL.pdf](https://www.imaginar.org/iicd/index_archivos/TUS12/7_Redex_FODETEL.pdf)

6 Calderón, M. J. (2017). Building a national and regional internet governance agenda in Ecuador. In A. Finlay (Ed.), *Global Information Society Watch 2017: National and Regional Internet Governance Forum Initiatives (NRIs)*. Johannesburg: APC. <https://giswatch.org/en/country-report/internet-governance/ecuador>

Ecuadorian law. A 2016 report indicates that spectrum regulation and network neutrality are at risk of political influence.<sup>7</sup>

In 2016, the last year for which data is published, the state reported that of individuals asked if they had used the internet in the past 12 months, the national average was 55.6%: the urban average was 63.8% and the rural average 38%.<sup>8</sup>

### Motivation, luck, knowledge and friends enable Ecuador's first community network

Our network exists because we want it to exist; we build it, we maintain it, and we use it – and sometimes we break it, we argue about it, we insult it when it goes slower than we like or cuts off entirely, and we get frustrated about it... but mostly it works and we are thankful. Our network also works because a friend shares his internet connection with us and allows us to tie our antenna to his balcony – many thanks!

On 16 April 2016, an earthquake off the coast of Ecuador caused significant damage and loss of life.<sup>9</sup> As part of the response to the earthquake, a part-time community member living in the United States gathered donations from friends and colleagues and came here with a friend to help rebuild. When the reconstruction activity in our community ended, we decided to invest our attention and the remaining money in creating a community network for internet connectivity. We decided that this fitted within the scope of building community resilience to handle future disasters.

We had already started investigating the possibility of a community network. We had looked at the topography of our community and the rest of our canton; the nearby telecommunications infrastructure; the history of rural internet in the country; companies selling networking equipment; local organisations that could give social

structure to the network and use the connectivity; and national organisations involved in community communications.

We asked for advice from AlterMundi,<sup>10</sup> contacts in Ecuador, and others. We also contacted a small internet service provider (ISP) mentioned in a 2008 article about community connectivity projects in Ecuador<sup>11</sup> and they visited our community. The response from everyone was more or less, “Start simple, with a single connection in your community.”

Before we found a line of sight to a place with internet, an invitation arrived from AlterMundi to participate in a seven-day hands-on community network workshop with people from farming community organisations in Colombia. We spent some of the earthquake relief money and some personal money to make the trip with one community member and two young adults from a nearby farmers’ union. The workshop helped us understand many things, such as how other communities organised their networks and how to configure Ubiquiti<sup>12</sup> Wi-Fi devices to create long-distance links.<sup>13</sup>

After the training, two members of AlterMundi came with us to our community, and provided the spark necessary to get our network going.

They advised us: Climb up to high places at dusk to identify potential links, and then just try the most obvious link in the fastest, least expensive way possible – fastest in terms of just buying an antenna instead of making antennas yourselves, and least expensive in terms of using a friend’s internet connection instead of contracting your own. In order to take a first step, let go of the idea of building a network for five communities all at once. Maybe that will happen, but it’s not the first step. Start with a single link, and that small, practical step will teach you things that enable you to grow the network later.

This turned out to work. One evening we climbed up to the top of a house being built on a hilltop and ta-da! The lights of a town twinkled in the distance! We spent the remaining earthquake money on the equipment to create the first part of our network and a few days later we had Wi-Fi internet in our community!

7 Solines Moreno, J. C. (2016). Telecomunicaciones e internet en el Ecuador del Siglo XXI: Apuntes técnicos, historia reciente y la ruta hacia el control de usuarios y contenidos. In D. Salazar & D. Viteri (Eds.), *Regulación de Internet y derechos digitales en Ecuador*. Quito: Editorial USFQ. <http://libros.usfq.edu.ec/index.php/usfq/catalog/book/1>. According to the report (translation ours): “[W]ithin the process of the empowerment of society, with a growth in the flows of information and a notable influence of social networks, the Ecuadorian state demonstrates a regulatory strategy, a model of institutional design, with certain public policies oriented towards the control of users and content. Even technical aspects such as the assignment and administration of spectrum and principles such as network neutrality are at risk of political influence, which can adversely affect fundamental rights and the development of the information society in Ecuador.”

8 Instituto Nacional de Estadísticas y Censos. (2017). *Tecnologías de la Información y Comunicaciones (TICs) 2016*. [www.ecuadorencifras.gob.ec/documentos/web-inec/Estadisticas\\_Sociales/TIC/2016/170125.Presentacion\\_Tics\\_2016.pdf](http://www.ecuadorencifras.gob.ec/documentos/web-inec/Estadisticas_Sociales/TIC/2016/170125.Presentacion_Tics_2016.pdf)

9 [https://en.wikipedia.org/wiki/2016\\_Ecuador\\_earthquake](https://en.wikipedia.org/wiki/2016_Ecuador_earthquake)

10 <https://www.altermundi.net>

11 Carrión, H. (2008). *Conectividad rural para el desarrollo: Experiencias en Ecuador*. [https://www.imaginar.org/docs/conectividad\\_rural\\_IICD.pdf](https://www.imaginar.org/docs/conectividad_rural_IICD.pdf)

12 <https://ubnt.com>

13 We learned to configure devices in order to create links that are the same regardless of the frequency. Ubiquiti sells some models in 900 MHz, 2.4 GHz and 5.8 GHz, all with the same configuration interface.

A few months later we applied for a grant to expand our network to other communities, and we learned a lot in the process of applying. We did not get the grant, but we gained knowledge.

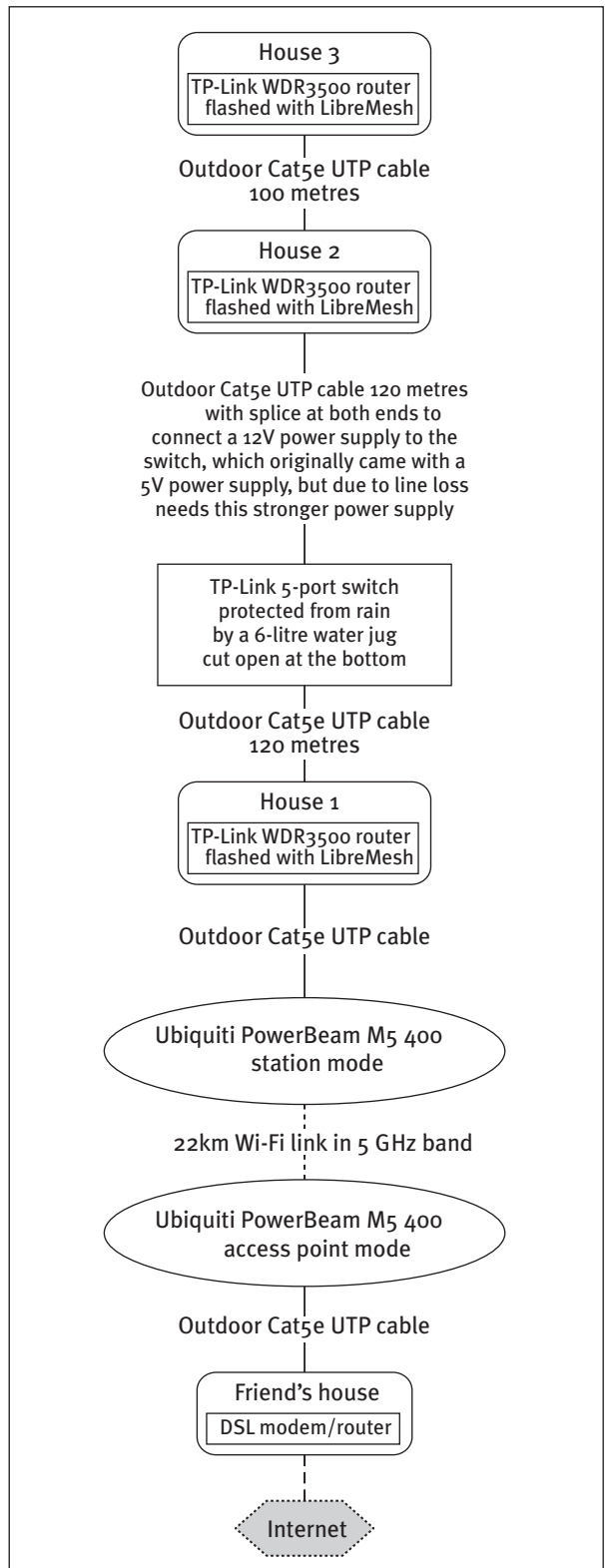
### Connection and infrastructure

Our connection to the internet for the first 17 months was a DSL line with a connection of 5 Mbps and an 8:1 contention ratio from the national public ISP, *Corporación Nacional de Telecomunicaciones EP* (National Telecommunications Corporation – CNT), shared with a friend in a small town. It cost about USD 33 per month. Now, after 17 months of asking them various times, the ISP activated a fibre optic connection at our friend’s house that is supposed to be 10 Mbps download and 5 Mbps upload with a 2:1 contention ratio for USD 79 per month; but in the first three weeks it has not performed better than the DSL.

Our network connects that internet connection to our community via a 22 km (line of sight) wireless link, and the network within the community is currently made up of Wi-Fi routers connected via outdoor UTP cable. We use cable instead of Wi-Fi because dense forest and hills block the line of sight between the houses.<sup>14</sup>

Some future connections will be wireless where there is line of sight. For those links, we want to use inexpensive antennas connected to TP-Link WDR3500 routers (or other routers compatible with LibreMesh<sup>15</sup> with disconnectable antennas), but if that proves too difficult or the price is close to the price of Ubiquiti devices, we will use Ubiquiti devices. We hope to acquire at least one LibreRouter<sup>16</sup> and backup power supplies, and to use alternative energy sources (solar, wind, micro-hydro, biogas).

We use two colours of electrical tape – red and green – for colour-coordinated markings that indicate what cable plugs into what port, so that we do not confuse what cables connect to the power-over-ethernet boxes.



<sup>14</sup> The Ubiquiti antennas/radios are attached to one-metre-long bamboo poles that are tied to balconies. The routers are in houses.

<sup>15</sup> <https://libremesh.org>

<sup>16</sup> <https://librouter.org>

## Failure and reorganisation

In December the ISP's DSL modem/router failed and we did not have internet for nearly a month, until the ISP fixed the problem. In April the connection between the antennas disappeared and no one could fix it from our community. After a month without internet we went to our friend's house and saw that a palm tree had grown in front of the antenna and blocked the signal.

The loss of internet gave us a chance to renew our way of organising the network. We started to have meetings at least once a month and soon we started contributing money and signed a contract for a fibre optic connection.

We had various challenges that we do not have space to discuss here:

- Debates about whether to connect the community centre or more homes first.
- Misunderstandings about money and motivations.
- Frustration about lack of participation.
- Lack of clarity about what routers and antennas to buy, or how to make our own antennas.
- Concerns about negative effects on human and ecosystem relationships.

## Gender, age and network uses

Part of the motivation to build the network grew specifically out of the vulnerability highlighted in the April 2016 earthquake, and also from the understanding that communication enables people to interact with many processes that affect the stability of their lives.

Having internet in our community makes it much easier to coordinate tourism, an educational programme in the community, or volunteers, and internet also attracts more visitors. This benefits the members of the community tourism association, most of whom are women. When people visit the community, women earn money by cooking for them and cleaning the community centre where they stay or have meetings. Men are occasionally hired as tour guides to take people on hikes in the forest. Many community members also appreciate the cultural experience of meeting people from other places.

Men tend to use the internet to communicate about work, some women use the network for academic study, and everyone uses the network for social communication with family and friends and entertainment. Women have participated in almost all the community network activities, such as meetings, installing the gateway node and antennas, and extending the network to more houses.

We have given specific attention to including women, people from all the families in our community and people of all ages in the conversations that guide our network and in the considerations of the impact of the network. The conversations happen in community meetings and in people's homes. The core group that has implemented the network so far makes an effort to include people in the construction of the network, to explain how it works to everyone interested, and awaken interest and a sense of capability in everyone in the community. We think that with encouragement, everyone is capable of understanding how the network functions and participating in the network as they choose.

The list below gives an indication of the gender breakdown in participation in various network activities:

- First months of preparation and coordination – one male, in conversation with many people.
- Installation of primary link – two females, three males (of these, one female and one male from AlterMundi providing support).
- First meeting – participants not recorded.
- Second meeting – four females, five males (after the meeting one male taught one female how to put RJ45 connectors on a UTP cable).
- Third meeting – seven females, nine males.
- Fourth meeting – six females, six males.
- Reposition of source antenna – two females, four males.
- Communicating with ISP to contract fibre optic connection – one male (contract signed by one female).
- Visit to town with internet connection for fibre optic link activation – one female, two males.

All installation and maintenance activities have involved people between the ages of 19 and 35. At meetings the age range has been about 10 to 65. The network offers teenagers and young adults in our community a chance to take responsibility for a community system, to learn and to demonstrate to their parents and themselves that they are capable of managing the community network. The adults already manage the water cooperative, the community bank, and the community tourism association.

## State policies and laws

We have not dealt with national internet policy directly, other than interacting with its effects: the lack of internet access in our community.

Our community and the surrounding area have very little state presence, so we have not found it necessary to approach the state (public ISP, regulatory agencies, legislators, elected officials) and we have not yet read all the laws and regulations – we just maintain our network and move along with our lives.

However, for our network to survive in the long term and to support the creation of new community networks throughout Ecuador, we consider it wise to understand the law and to influence it and interpret it in ways that defend and support our community networks. As far as we know, the legal system, the regulations and the people tasked with enforcing them have not interacted with community networks, since we are the first such network here.

Due to 10 years of tight state control in many areas of society (2007 to 2017), we have so far chosen to remain unnoticed, rather than risk state attempts to co-opt, regulate, or shut down our network. Recently an ally in contact with state telecom institutions told us that the current national government is favourable towards the idea of community networks and community spectrum use. We have also had some contact with a rural mayor who wants to support a community network in his canton even though we explained that the legal aspects are unknown.

We serve as an early experience of the potential of community networks in Ecuador, and we plan to use our experience adapting this model to our context as a basis for conversation with other communities, organisations, ISPs and the state about how to support this new way of co-creating internet infrastructure. We hope that the state and ISPs of all sizes adapt to this reality, rather than trying to stop or control the formation of community networks.

## Conclusions

We draw the following conclusions from our experience of setting up a community network in Ecuador:

- The conditions in Ecuador are ripe for community networks, but a spark and organising initiative such as a national coalition has been lacking until now.
- In our community, communicating clearly and organising ourselves is very important. Even if no one is charging us money for our internet connection, we still benefit from organising ourselves, and it makes sense to collect money for future expenses.
- Achieving and maintaining connectivity requires attention, time, money, understanding, confidence and perseverance. Otherwise people give

up and say “I don’t know how” or “We don’t have time and money to go wait for the technicians to install the connection.”

- Communication with external actors is a key part of organisation.
- In many communities we (humans) get things working just enough, and then shift our focus to the next urgent issue. In our case we created a precarious connection and did not focus on stabilising it until it broke down for a month, and when we started to help set up other networks in other parts of the country and wanted our network to serve as an example of a well-run community network.
- Extending the physical infrastructure starts with deciding who pays for equipment, who performs maintenance and management, what the technical design is and what hardware will be used. In order to create clear understanding among network members, it helps to make these decisions before heading out into the field.
- Interact with other communities that have experience in or the desire for community communications and self-managed infrastructure. Connect community networks (the organised people, the infrastructure, and the concepts) with the global and local movements towards well-being and freedom based on peer-to-peer cooperation. Participating in movements helps us to learn, build community relationships, and improve our ability to influence state and commercial processes.
- Support communities to create their own processes of appropriating information and communication technologies, recognising that our current concept of “community network” is shaped by our cultural perspective and our history of appropriating technology, and can look different in different communities and change over time.

## Action steps

Action steps for our network:

- Improve skills in meeting facilitation and conflict transformation.
- Learn how to use the internet for useful and creative things.
- Decide on ways for neighbours and visitors to participate in our network.
- Improve and extend the physical infrastructure.
- Participate in the global community network movement.



Action steps to advance community networks in Ecuador:

- Advocate for:
  - Community network access to infrastructure and resources including towers, power sources, TV white space frequencies and the idle bandwidth of public institutions.
  - Exempting community networks from licensing or registration requirements that require payment or advanced technical studies.
- Grow and strengthen the emerging network of people and organisations working to advance community networks in Ecuador via training, financing, advocacy and movement building.
- Participate in the Internet Society (ISOC) Community Networks Special Interest Group.<sup>17</sup>
- Conduct a market scan to clarify what networking hardware is available in Ecuador.
- Acquire LibreRouters in order to build community networks with a lower cost and more efficient technical design. The LibreRouter includes three radios in a single device that is projected to cost USD 150.
- Get the LibreRouter through the state approval process (so-called homologation or type certification) so that we can use it in state-funded or state-regulated networks.
- Consider ways to access the state's Universal Access Fund to train communities and buy network hardware.
- Implement the ITU-certified Diploma in Community Networks.<sup>18</sup>
- Promote the Inter-American Telecommunication Commission (CITEL) Draft Resolution on "Connecting the Next Billion, Boosting New Communication Patterns for Unserved Areas".<sup>19</sup> This promotes community networks and could serve as another instrument in advocating for state support of community networks.

---

<sup>17</sup> [cnsig.info](http://cnsig.info)

<sup>18</sup> <https://techiocomunitario.net/diplomado>

<sup>19</sup> <https://www.itu.int/net4/proposals/WTDC17/Detail/Index?idProposal=48505>

## Community Networks

THE 43 COUNTRY REPORTS included in this year's Global Information Society Watch (GISWatch) capture the different experiences and approaches in setting up community networks across the globe. They show that key ideas, such as participatory governance systems, community ownership and skills transfer, as well as the "do-it-yourself" spirit that drives community networks in many different contexts, are characteristics that lend them a shared purpose and approach.

The country reports are framed by eight thematic reports that deal with critical issues such as the regulatory framework necessary to support community networks, sustainability, local content, feminist infrastructure and community networks, and the importance of being aware of "community stories" and the power structures embedded in those stories.

GLOBAL INFORMATION SOCIETY WATCH

2018 Report

[www.GISWatch.org](http://www.GISWatch.org)



**IDRC | CRDI**

International Development Research Centre  
Centre de recherches pour le développement international

**Canada**