

# GLOBAL INFORMATION SOCIETY WATCH 2018

## *Community Networks*



ASSOCIATION FOR PROGRESSIVE COMMUNICATIONS (APC)  
AND INTERNATIONAL DEVELOPMENT RESEARCH CENTRE (IDRC)

# Global Information Society Watch

## 2018



**IDRC | CRDI**

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International Development Research Centre  
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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>  
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Financial support provided by



Sida

*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

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

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# BRAZIL

## HOW COMMUNITY NETWORKS IN MARANHÃO ARE HELPING *QUILOMBOLAS* PROMOTE THEIR RIGHTS



### Instituto Nupef

Oona Castro, with the collaboration of Carlos Alberto Afonso and Paulo Duarte  
<https://nupef.org.br>

### Introduction

Although access to broadband internet has been growing in Brazil, one still finds a huge access gap in some regions and among certain population groups. This is the case of many *quilombola* communities in the state of Maranhão, situated in the Northeast region of Brazil. A *quilombo* is a settlement inhabited by descendants of Afro-Brazilian slaves who escaped from plantations before the abolition of slavery in Brazil in 1888. These communities are mostly located in rural areas, where quilombolas preserve their culture and the environment. They still need to fight for lots of basic rights – such as access to lands, to public services such as health, education and communications. In these areas, telecommunications operators barely provide access to the internet and, when they do, the service is usually of very low quality and not affordable.

This situation motivated Instituto Nupef – Núcleo de Pesquisas, Estudos e Formação, in partnership with local communities, to develop a pilot programme creating two community mesh networks in these communities, connecting quilombolas from different municipalities.

This report discusses the process of setting up these networks, and points to the benefits for the local communities.

### The context

In 2017, two networks were implemented in Maranhão: the first one, which has been operational since June last year, in the municipality of Penalva, and the second in the municipality of Cajari, in operation since December 2017. Both cities received an internet link in August.

Both Penalva and Caraji contain part of the Baixada Maranhense Environmental Protection Area,<sup>1</sup> a sustainable use conservation unit created in 1991.

The municipalities are officially considered “extractive reserves”, according to Brazilian law. A river divides the two municipalities, and, depending on the season, this can be dry or in flood, with the water at different levels due to rains or river tides.

The estimated population of Cajari, according to the 2010 census, was about 18,751 inhabitants.<sup>2</sup> Nevertheless, the population in the community where the network was implemented was about 300 people. The population of Penalva, according to the same census, was estimated at 34,246 inhabitants,<sup>3</sup> but the community in the rural area has about 26,000 people, and there are about 1,000 people living in the area served by the network.

### Brief history: Choosing the communities and the model

The two communities in Penalva and Caraji were chosen based on an analysis of their socioeconomic conditions and after talking to different groups. Among these was a project called New Social Map of the Amazon,<sup>4</sup> located in the social anthropology programme at the federal University of Amazonas. The project builds knowledge about the Amazon region and its inhabitants by mapping information that regular cartography usually ignores, such as conflict areas, and relations between peoples and territories. As a result, their work serves as a tool for strengthening social movements. The project identified communities for Instituto Nupef to start talking to.

A few conditions were necessary to have a community network implemented: the first and most important was the local need and motivation to get one in place and ensure continuity. The second and very crucial condition was that a community governance association had been set up in the communities that we could engage with. Affordable connectivity provided by the market also needed to be absent, while the geography needed to be amenable to a mesh network being set up. After some deliberation, we decided that the best

<sup>1</sup> [https://en.wikipedia.org/wiki/Baixada\\_Maranhense\\_Environmental\\_Protection\\_Area](https://en.wikipedia.org/wiki/Baixada_Maranhense_Environmental_Protection_Area)

<sup>2</sup> [https://censo2010.ibge.gov.br/sinopse/webservice/frm\\_urb\\_rur.php?codigo=210250](https://censo2010.ibge.gov.br/sinopse/webservice/frm_urb_rur.php?codigo=210250)

<sup>3</sup> <https://censo2010.ibge.gov.br/sinopse/index.php?dados=21&uf=21>

<sup>4</sup> [novacartografiasocial.com.br](http://novacartografiasocial.com.br)

communities to run the pilot were the quilombos of Bairro Novo in Penalva and Camaputua in Cajari.

After initial discussions, Instituto Nupef planned how to set up the networks. The first idea was to install a tower that would connect the two mesh networks set up in the communities. However, the costs related to setting up the tower were too high. The city hall in Penalva had a telephone tower that was in use and we considered the possibility of using that to connect the radios; but in the end it proved to be cheaper and easier to contract a satellite internet link that would connect the network access points to the internet.

## Setting up the networks

Building the networks involved about 20 people from inside and outside the community. Nupef's team managed the process. With the help of community volunteers it also mapped the areas to determine the spots where radios should be installed, offered technical training to community members so that they could fix common problems, and developed software and hardware solutions for the networks. The community volunteers helped engage other people in the community, and also assisted with some technical issues such as installing the routers.

The first step was to do a site survey (or geo-referencing) in each community, establishing the coordinates needed to create the mesh. In the quilombo of Bairro Novo, seven radios were used, covering a perimeter of about 520 metres and an area of about 17,770 square metres. In the quilombo of Camaputua, which is a much smaller community, five radios covered a perimeter of 1,020 metres and an area of about 20,600 square metres.

In Penalva, 75 users received a password to connect to the internet. They then shared their passwords with other community members, reaching a total of over 465 connected devices.

In Cajari, where 118 families live, 20 people received passwords and use the network regularly. Besides that, 200 people have been benefiting from intermittent internet access, and have been issued with daily passwords when necessary. Many of these are people from other communities that commute to Cajari in order to use their network.

Using the network, Camaputua's quilombola association has helped over 400 community members get their national identity numbers (CPFs) and other documents which are required for participation in social and government programmes, economic transactions, and securing individual rights (such as support for family agriculture,

funding opportunities, opening bank accounts, and the recognition of land access rights).

## Applications and systems

As the networks are connected to the internet through satellite links, they both have access to standard internet services such as VoIP telephony, email, social networks and video streaming (initially this was provided using Elastix).<sup>5</sup>

Nupef's team used LibreMesh on the routers, an OpenWrt/LEDE-based firmware for wireless mesh nodes. Community members were taught how to change passwords and other system configurations, and even how to perform some advanced tasks like saving customised configuration on the devices using the LibreMesh "cook" function.

## Sustainability

It is important to note that a key decision with regard to the sustainability of the project was to make use of common and easily accessible equipment. The initial purchase of equipment was made by the Nupef team. A computer, routers, cables, boxes to protect the radios, and other hardware and accessories were bought, as well as extra routers and other items so the community had spare equipment available in case of the need for replacement (they have already replaced some). The equipment purchased is easily available in the capital of Maranhão, São Luis, in case the community needs to buy new hardware.

Through the two community associations, local managers (who are leaders in those communities) have been collecting very small amounts of money each month from community members to pay for the satellite link and make improvements to the project. Bairro Novo's community association has already been able to buy a printer – as many users said they needed one. In Cajari, the community is smaller and so is the group of regular network users, so they have not been able to make improvements to the network so far. However, they are managing to cover the costs of the satellite link.

## Women in the network

Women are active in both networks, especially in Penalva, where the leadership of two women from the community was key for achieving success: Maria Nice Machado Aires and Geovania Machado Aires have played and continue to play very important

<sup>5</sup> Elastix is a unified communications server software that offers tools such as IP PBX, email, instant messaging, fax and other functionalities. Available at: <https://www.elastix.org/pbx/small-business-phone-system>

roles in setting up the network and in its sustainability. From the very beginning they demonstrated strong interest in getting the community to embrace the new project.

Maria Nice was born in 1954 in Penalva and represents communities such as quilombolas, babassu oil harvesters, smallholders and other traditional communities. Geovania, 30 years old, a quilombola and a teacher with a master's degree, became the number one assistant in the network in Bairro Novo and coordinates the project locally. She handles both technical and management issues. While Maria Nice and Geovania are mainstays for the community network in Penalva, both contributed enormously to the set-up of the network in Cajari too, by connecting us with local leaders (they introduced us to a local leader there, Ednaldo Padilha, also known as "Cabeça") and by providing organisational support.

Through testimonies from community leaders we learned that women have benefited significantly from the networks. Mothers have been able to apply for maternity leave government support, while many have embraced the project as they were used to paying about 150 Brazilian reais (over USD 35) a month so their children could go downtown to do homework and research, apply for public exams and programmes and take care of other school-related needs in LAN houses<sup>6</sup> – that is, they paid for transportation and for using computers at the centres by the hour. Now they pay 20 Brazilian reais (less than USD 5) per month through a cooperative model to help the local association keep the networks running so their children have access to the internet within their communities whenever they need it.

## Legislation and enforcement

The regulatory framework related to telecommunications and spectrum control and allocation is made up of a wide variety of laws, resolutions and norms, defined by the Congress and the federal government as well as Anatel, the regulatory agency. There are many bills under debate in the Congress, among which is a bill to change the General Law of Telecommunications<sup>7</sup> (*Lei Geral de Telecomunicações*). Spectrum allocation is the responsibility of the Ministry of Communications (for radio and TV) and Anatel. A complex mosaic of different laws apply to different services related to the use of the spectrum. The National Frequency Plan in

Brazil<sup>8</sup> dates from 2016<sup>9</sup> and dozens of resolutions by Anatel regulate the use of frequencies and radio communications, as well the provision of broadband services. Describing and analysing all this legislation would result in a paper itself – and a very complex one, since there are lots of gray areas and rules to be defined.

In our context, what is most important is that according to Resolution No. 506/2008,<sup>10</sup> broadband wireless access systems for local networks were exempted from authorisation when providing access to no more than 5,000 people. However, this resolution was revoked by Resolution No. 680/2017.<sup>11</sup> While the exemption remains, Anatel seems to require, as of 2018, registration on Mosaico,<sup>12</sup> a platform meant to manage spectrum allocation.

There have been controversial decisions by different courts on the issue of spectrum. In April 2018, a decision by the Superior Court of Justice stated that "the principle of insignificance did not apply to cases of clandestine transmission of internet signals through radiofrequency that is characterised as a criminal act in article 183 of Law No. 9472/1997."<sup>13</sup> The principle of insignificance is one that judges apply whenever they analyse the infringement as one that did not cause a significant harm. This decision conflicts with a decision by the Supreme Federal Court from 2017, according to which *habeas corpus* had been granted to acquit a defendant accused of practising clandestine telecommunications activities, based on the principle of insignificance.<sup>14</sup> This may affect the principle of legal certainty and impact on innovation and social changes due to fear of being punished for creating networks that are not protected by the law.

The networks in Penalva and Cajari are not yet registered on the Mosaico platform or with any other government body. However, these networks operate within the confines of the law, under the exemption granted to wireless networks for fewer than 5,000 people in the 2.4 GHz and 5 GHz frequencies.

8 [www.anatel.gov.br/Portal/verificaDocumentos/documento.asp?numeroPublicacao=346331&assuntoPublicacao=null&caminhoRel=null&filtro=1&documentoPath=346331.pdf](http://www.anatel.gov.br/Portal/verificaDocumentos/documento.asp?numeroPublicacao=346331&assuntoPublicacao=null&caminhoRel=null&filtro=1&documentoPath=346331.pdf)

9 A new one was approved in June 2017, but was later revoked in January 2018, due to debates over criteria, frequency bands, and other issues.

10 [www.anatel.gov.br/legislacao/resolucoes/23-2008/104-resolucao-506](http://www.anatel.gov.br/legislacao/resolucoes/23-2008/104-resolucao-506); also available in English: [http://www.americascompliance.com/wp-content/uploads/2011/08/506-English\\_1.pdf](http://www.americascompliance.com/wp-content/uploads/2011/08/506-English_1.pdf)

11 <http://www.anatel.gov.br/legislacao/resolucoes/2017/936-resolucao-680>

12 <https://sistemas.anatel.gov.br/mosaico/login/login?service=http%3A%2F%2Fsistemas.anatel.gov.br%2Fmosaico%2Fportal%2FportalInternet>

13 <https://www.estrategiacursos.com.br/blog/sumula-606-stj>

14 *HC 138134/BA, rel. Min. Ricardo Lewandowski, julgamento em 7.2.2017. Informativo STF 853.*

6 LAN houses are commercial initiatives that provide access to the internet, similar to cybercafés.

7 [www.anatel.gov.br/legislacao/leis/2-lei-9472](http://www.anatel.gov.br/legislacao/leis/2-lei-9472)

## Action steps: The future and final considerations

The networks in Penalva and Cajari are meant to serve as a vital tool for the quilombola movements – those who struggle for the rights of these communities. Feedback has been extremely positive. With the success of the community networks in Penalva and Cajari, people in surrounding communities now want the networks to be expanded to give them access, and have requested Instituto Nupef's support to find the resources and to implement the new networks with them.

For Instituto Nupef, despite its significant experience in implementing information and communication technology (ICT) projects for populations with no access to the internet, this pilot improved the organisation's know-how on social and technical aspects related to building networks in rural areas. Nupef is now in dialogue with other organisations and social movements interested in implementing similar projects in their communities, including babassu oil harvesters.

On the advocacy level, our experience has reinforced the importance of keeping our eyes wide open in the field of community connectivity, though it is a considerably vast one that requires

a dedicated group of people watching and trying to influence decisions with a social and public-interest perspective. It is not an easy task, as there are resource constraints related to people, money and time; but it is definitely a key one if we want to see the enforcement of communication rights in Brazil.

Finally, we propose setting up a programme in Brazil on community networks that will serve as a dynamic reference point for the application of networking at the community level. The purpose of this programme will be to produce and share knowledge and information on community connectivity, and to develop the capacities of individuals and organisations. In particular we are interested in the innovative use of ICTs which may support sustainable development, human rights, social justice, good governance and democratic values.

This involves not only creating and maintaining a periodically updated repository of rules and regulations that affect spectrum policies and practices which impact on networking initiatives in local communities, but also building knowledge and capacities by directly implementing local community networks where they are socially needed and where the market does not provide the means to make access happen.

# 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.

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2018 Report

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



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