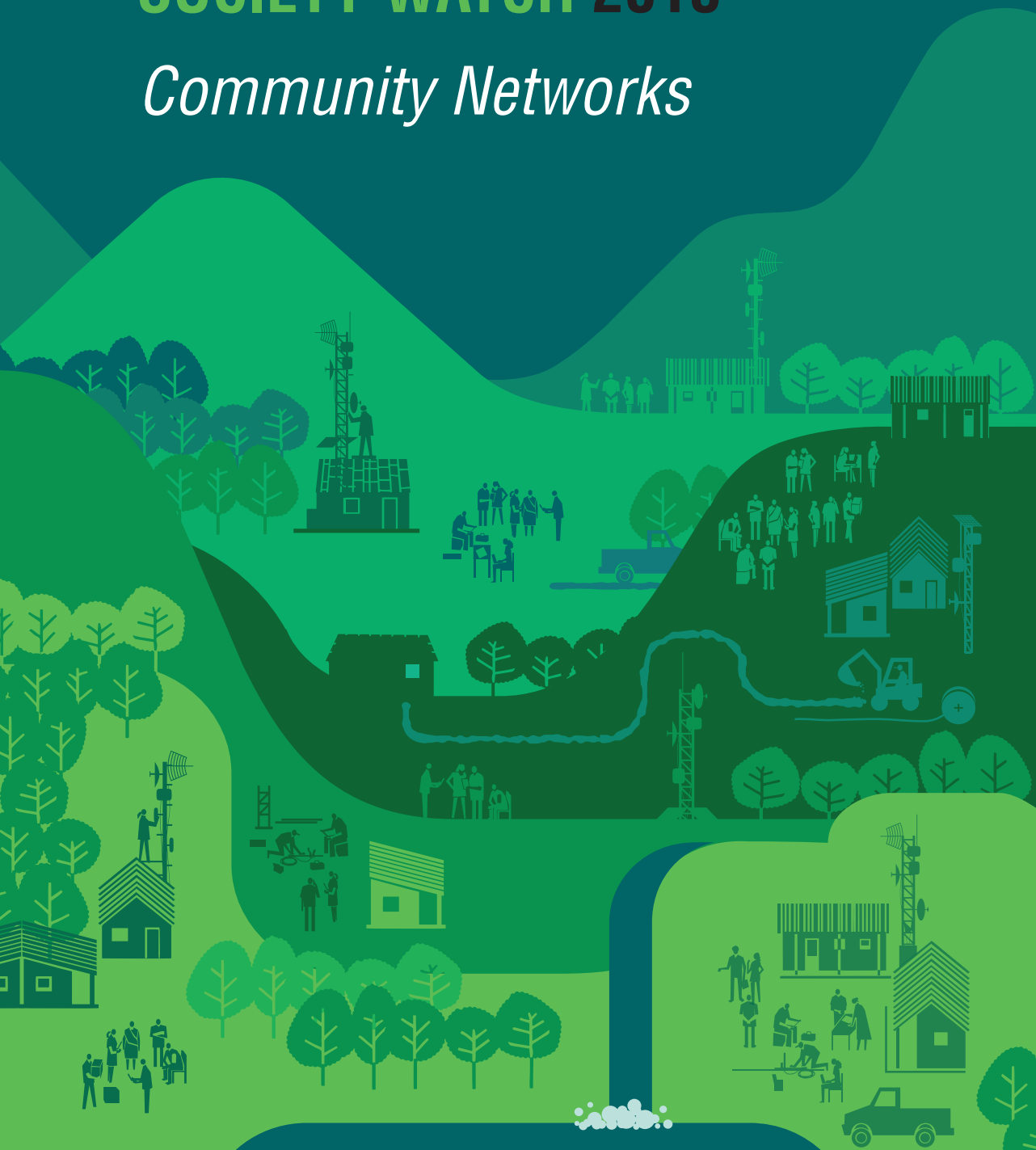
GLOBAL INFORMATION SOCIETY WATCH 2018

Community Networks



Association for Progressive Communications (APC)
and International Development Research Centre (IDRC)

Global Information Society Watch

2018

APC

IDRC | CRDI Canada

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
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

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

Community networks and telecommunications regulation

Steve Song
Fellow in Residence, Mozilla Foundation
https://manypossibilities.net

Regulation should not just be about large operators

The world of cables and radio waves that make up the underlying physical communication infrastructure on which the internet is built is fundamentally different from the digital world of the internet where permissionless innovation rules. Where affordable access to the internet exists, the barriers to manifesting a work digitally are extremely low. Although there are signs that this may be changing, the internet remains a realm largely free of regulation. Digital producers require no licence or certification to create, just the willingness to invest the time and effort in the production.

Telecommunications infrastructure comes from a very different history. As centrally controlled, top-down networks based on a command-and-control philosophy, their underlying conception is radically different from the more organic, bottom-up network of networks that is the internet. There are reasons for this. At the time the first large-scale telecommunication networks were being developed, their construction was an effort so extraordinary and expensive that they were typically only undertaken by national governments. Following the tradition of postal services, countries undertook the provision of telecommunication infrastructure as a public good.

This began to change in the early 1990s as, around the world, governments began to embrace privatisation as a means of addressing inefficiencies in state-run infrastructure monopolies as well as a means of generating revenue for the exchequer. In most countries, privatisation was accompanied by a process of market liberalisation allowing for competition for the first time. Part of the privatisation and liberalisation involved the establishment of regulatory frameworks and organisations to ensure that the public good was still being served and that the resulting privatised and liberalised market was fair, open and competitive.

It is not surprising that these regulatory bodies were designed to deal with large-scale national companies, because it required millions (even billions) of dollars of investment to build a national communication network including the international connectivity, national backhaul (long-distance, high-capacity infrastructure) and last-mile infrastructure.

Because of this, most telecommunication regulatory frameworks are designed with these large corporations in mind, with implications for organisational capacity. It is implied, for example, within most regulatory processes and requirements that the applicant has the time and resources that the legal department of a large telecommunications corporation might possess to fulfil detailed applications and reporting requirements as well as draft submissions and commentary on new proposed regulations. With the new norm of auctioning high-demand spectrum, it is assumed that any telecommunications organisation should have the millions of dollars required to bid on spectrum licences.

An exception to the above model has emerged, however, with the growth of the use of Wi-Fi technologies. Wi-Fi equipment operates in the licence-exempt frequency bands which are regulated through technological constraints rather than the requirement of a user licence. The licence-exempt nature of Wi-Fi has created a very low market barrier for both manufacturing and deployment of this technology. Wi-Fi has proven successful as both an access technology and a backhaul technology, making it suitable for a wide range of deployments. It is estimated that the Wi-Fi market will be worth USD 15.6 billion by 2022.[1] Wi-Fi has allowed people to build out broadband networks in a manner that was not foreseen by regulators. It has allowed for independent initiatives to establish connectivity in places that were either unserved or where access was deemed expensive by citizens. It has enabled the rise of small-scale operators both in the form of non-profit community-owned networks and commercial wireless internet services providers (ISPs).

1 MarketsandMarkets. (2018, 23 March). Wi-Fi Market worth 15.60 Billion USD by 2022. https://www.marketsandmarkets.com/PressReleases/global-wi-fi.asp

The disaggregation of the telecommunications network supply chain has also enabled the use of Wi-Fi for internet access at the community level. Historically, telecommunication operators managed the entire communication network infrastructure, from international backhaul links through undersea cable to national fibre optic and microwave backhaul networks to the last mile connecting consumers. Increasingly, international, national and metropolitan network infrastructures are available as wholesale services to any operator, lowering the bar to market entry for smaller operators who can focus on last-mile delivery.

Finally, communication technology in general has come down dramatically in cost. Not only has Wi-Fi technology become extremely affordable, but all kinds of communication technologies, from point-to-point microwave to GSM to LTE base stations have dropped in price; even fibre optics now have prices that are within the reach of the community network and small-scale operator.

All of these changes represent tremendous potential for community networks.

Nevertheless, most regulatory frameworks have yet to catch up with these changes and are not structured in such as way as to enable communities to easily take advantage of them. Most community networks happen in spite of existing regulatory frameworks, not because of them.

Regulation needs to evolve

Most regulatory and policy frameworks focus on the provision of broadband access primarily by a limited number of national mobile operators. This presents barriers to other models of access that can complement the existing players, whose business models are less able to cost-effectively serve remote and sparsely populated areas.

Regulators need to recognise community networks and small-scale operators as an essential part of their regulatory strategy, representing an important complementary approach to access delivery that can address geographic or sectoral gaps in service delivery. This is not a case of replacing one approach with another but of recognising that countries do not have one single economy. French historian Fernand Braudel[2] argued that economies can be understood at three different levels: ordinary economic life at the base, where local efforts are consumed locally; then the market economy of cities, markets and trade, currencies, transport systems, etc.; and at the top, capitalism, where competition for control of entire trade networks or even entire economies exists. Regulation should acknowledge the existence of these levels of economy and their value in delivering affordable access.

Metaphorically, we might think of regulation as trying to fill a glass jar with stones. Current regulation accommodates only one fist-sized type of stones. When we attempt to fill the jar, we can fit three or four stones in at best. The jar may look full, but if we were to fill the remaining space with water, it would fill more than half the volume in the jar. What is needed is regulation that enables smaller stones and even tiny pebbles so that we might fill the jar.

This approach acknowledges and continues to value larger operators but recognises that smaller-scale operators and even subsistence operators have an important role to play as well. It is important to note that the small-scale operators and community networks may not be designed to scale to the size of large operators, but rather to serve the geographic, economic and sector niche they were designed for.

In order for this to happen, there are a host of enabling regulations that are needed.

Licensing

Many countries have yet to move to a modern unified regulatory regime based on technological neutrality and simple authorisations to permit service provision. National licences are often the only type available and may come with substantial administrative reporting requirements and fees. Although a few countries like Brazil and India have adopted tiered licensing systems which provide licences at the regional or municipal level, the requirements for these are still bureaucratic, and the technical and financial requirements are beyond the means of most potential operators. In countries like New Zealand and the United States, no specific licence is required to become an operator below a certain level of operation. Awareness raising about existing good practices and capacity-building work among policy makers and regulators are needed to address this situation.

Access to radio spectrum

While licence-exempt Wi-Fi has grown exponentially in deployment and application, demand for exclusive-use licensed spectrum has also grown. Operators are now expected to pay millions of dollars at auction for an exclusive-use spectrum licence. This creates an insuperable barrier for all but the largest companies to gain access to this spectrum, and even those that do gain access may be

2 See: dannyreviews.com/h/Civilization_and_Capitalism.html

obliged to pass on the cost of that spectrum to consumers. There is a need to build on the success of licence-exempt spectrum by exploring new frequencies that might be similarly regulated. There is also a need to find a middle ground between licence-exempt and national exclusive-use licences. This may include new approaches such as dynamic spectrum regulation needed for TV white space (TVWS) spectrum or Citizens Broadband Radio Service (CBRS).[3] It might also include alternative licensing for rural, underserved regions. There is scope for a range of creative alternatives. Finally, new technologies such as radio devices which operate over a much wider range of spectrum bands and use spectrum sensing suggest that we may be on the cusp of a paradigm shift in spectrum management.

Access to passive infrastructure and backhaul

As demand for broadband grows, especially with the rise in streaming media content through services like YouTube and Netflix, access to affordable, high-capacity backhaul services becomes one of the most critical limiting factors in the delivery of affordable access. Open access policy and regulation for backhaul networks are essential to ensure equitable access. Perhaps more importantly, pricing on these networks needs to reflect the national strategic assets that networks are. Like roads or railways, broadband backhaul networks should be designed and priced to maximise traffic in order to realise the full potential for positive externalities that these networks represent. Similarly, passive infrastructure, such as the towers of mobile operators and the masts and poles of public broadcasters and energy distribution grids, should be considered from the point of view of enabling all kinds of operators.

Transparency

Even if fibre is available nearby, it is often very difficult for a new operator to know where the nearest point of presence is, so it can design and cost the network accordingly. It is also difficult to know who has been assigned licences to radio frequencies that might be unoccupied or unused in rural areas. Similarly, access to information on tower locations is needed so that both governments and other actors can identify the connectivity gaps and adopt the best approach to close them. Information on the deployment of fibre, towers and spectrum infrastructure should be a matter of public record. This is essential both from the point of view of transparency, where millions of dollars are changing hands, but also from the point of view of enabling the identification of market gaps and possible solutions.

Associated taxation

Finally, there are many taxes that add to the burden of starting and operating networks. In some countries, import taxes are up to 40% of the total cost of the equipment. Other taxes include fees per mast and device installed and contributions to universal service funds, among others. These added costs must be recovered from end-users, which further limits the service's affordability.

Conclusion

The very low barriers to digital production on the internet have enabled an explosion of creativity in content and services, which is steadily increasing the value of being connected. Those without affordable access to the internet are increasingly socially and economically left behind. In order to ensure that everyone has affordable access to communication, we need to unleash the same kind of energy that spurred the growth of internet content and services. Lowering barriers to the establishment and operation of community networks will exploit the pent-up demand (and creativity) of the underserved, allowing them to implement low-cost, local connectivity solutions that can sustainably serve their constituencies. Regulators must recognise that community networks have an essential complementary role to play in the delivery of affordable access for all.

3 CBRS is a regulatory framework under development in the United States which applies similar dynamic spectrum allocation principles to TVWS but for the delivery of LTE services in the 3.5 GHz frequency band. It is designed to enable both large and small-scale operators.

GLOBAL INFORMATION SOCIETY WATCH 2018

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

ISBN 978-92-95102-07-1
9 789295 102071

IDRC | CRDI
International Development Research Centre
Centre de recherches pour le développement international

Canada