

Community Networks: the Internet by the People for the People

Preview prepared by Luca Belli

This is the preview of the book “**Community Networks: the Internet by the People for the People**,”¹ which is the Official 2017 Outcome of the UN IGF Dynamic Coalition on Community Connectivity (DC3).² DC3 is a multistakeholder group³ aimed at fostering a cooperative analysis of the community network model, exploring how such networks may be used to foster sustainable Internet connectivity while empowering Internet users. DC3 provides a shared platform involving all interested individuals and institutions into a multistakeholder analysis of community connectivity issues. This book should be seen as a further step towards a better understanding of community networking and is built upon the previous efforts of the DC3.⁴

This volume is structured in two sections (i) exploring challenges and opportunities for community networks in four different continents (CNs) and (ii) analysing a series of case studies and forward-looking proposals regarding CNs. As a conclusion, this work includes the updated version of the **Declaration on Community Connectivity**, which was elaborated through a multistakeholder participatory process, featuring an online open consultation, between July and November 2016; a public debate and a feedback-collection process, during the IGF 2016; and a further online consultation, between December 2016 and March 2017.

As stated by the Declaration on Community Connectivity, CNs are crowdsourced networks

“structured to be open, free, and to respect network neutrality. Such networks rely on the active participation of local communities in the design, development, deployment, and management of shared infrastructure as a common resource, owned by the community, and operated in a democratic fashion. Community networks can be operationalised, wholly or partly, through individuals and local stakeholders, NGO's, private sector entities, and/or public administrations.”

For this reason, it can be argued that CNs promote an **individual-centred Internet**, for the people, by the people. Building on the previous works of the DC3, this book aims at fostering a better understanding of what are CNs and the opportunities that these initiatives offer to develop of a sustainable Internet environment, fostering a sustainable connectivity agenda and allowing the greatest possible number of individuals to enjoy the benefits of information and telecommunications technologies.

¹ The book is edited by Luca Belli and published by FGV Press and will be released at the DC3 session, during the IGF 2017. The volume includes two prefaces, authored by Kathy Brown and Jan Dröge and ten chapters drafted by fourteen authors – specifically acknowledged throughout this document – who participated to the DC3 Call for Papers.

² For further information on DC3, see www.comconnectivity.org

³ Dynamic Coalitions are components of the UN Internet Governance Forum. Coalitions are informal, issue-specific groups comprising members of various stakeholder groups. See <https://www.intgovforum.org/multilingual/content/dynamic-coalitions-4>

⁴ See http://www.intgovforum.org/multilingual/content/dynamic-coalition-on-community-connectivity-0?qt-dynamic_coalition_on_community_c=4#qt-dynamic_coalition_on_community_c

1.1. Challenges and Opportunities for Community Networks

The first part of this volume explores a variety of regulatory, technical, social and economic challenges raised by community-networking initiatives. The five chapters included in this part do not simply analyse the challenges faced by CNs but put forward potential solutions, suggestions and recommendations that are based on critical observation and evidence-based analysis and should be considered by all stakeholders.

In the opening chapter on “**Network Self-determination and the Positive Externalities of Community Networks**,” Luca Belli argues that existing examples of CNs provide a solid evidence-base on which a **right to network self-determination** can be constructed. Network self-determination should be seen as the right to freely associate in order to define, in a democratic fashion, the design, development and management of network infrastructure as a common good, so that all individuals can freely seek, impart and receive information and innovation. First, this chapter argues that the right to network self-determination finds its basis in the fundamental right to self-determination of people as well as in the right to informational self-determination that, since the 1980s, has been consecrated as an expression of the right to free development of the personality. In this sense, the author emphasises that, network self-determination plays a pivotal role allowing individuals to associate and join efforts to bridge digital divides in a bottom-up fashion, freely developing common infrastructure.

Subsequently, Belli examines a selection of CNs, highlighting the **positive externalities** triggered by such initiatives, with regard to the establishment of new governance structures as well as the development of new content, applications and services that cater for the needs of the local communities, empowering previously unconnected individuals. The chapter offers evidence that the development of CNs can prompt several positive external-effects that considerably enhance the standards of living of individuals, creating learning opportunities, stimulating local entrepreneurship, fostering the creation of entirely new jobs, reviving social bounds amongst community members and fostering multistakeholder partnerships. For these reasons, policymakers should design national and international **policy frameworks** that recognise the importance of network self-determination and facilitate the establishment of CNs rather than hindering their development.

In his chapter on “**Barriers for development and scale of Community Networks in Africa**,” Carlos Rey-Moreno explains that that CNs should be seen as communications infrastructure deployed and operated by citizens to meet their own communication needs and such initiatives are being increasingly proposed as a solution to foster connectivity. However, Rey-Moreno emphasises that, in Africa, where the proportion of unconnected individuals is among the highest globally, the number of initiatives identified is relatively low considering the continent’s size and population. Hence, the chapter focuses on **the barriers** that prevent more CNs from appearing or existing ones from becoming sustainable and scaling. The barriers identified range from the lack of awareness of both the potential benefits of accessing information, and the Internet more generally, and the possibility for communities to create their own network, to the lack of income of the people who would like to start one. Importantly, the author notes that most of the people within the next billion to be connected **need to choose**, daily, between Internet/communication networks and other vital necessities such a food and health.

The unreliable (or the complete lack of) electricity in most of these areas, and the high cost of backhaul connectivity, also affects the capital required to start and operate CNs. The lack of local technical competencies, and a regulatory framework not conducive for the establishment of small, local

communication providers, are also identified as the main barriers for growth of community networks in the region. Despite this breadth of barriers, African communities are proving that some, if not all, of these barriers have been addressed. As stressed by Rey-Moreno, this is motivating global organisations to contribute creating an **enabling environment** that removes these barriers.

In his chapter on “**Community Networks as a Key Enabler of Sustainable Access**,” Michael J. Oghia defines sustainable access to the Internet, as the ability for any user to connect to the Internet and then stay connected over time, thus contributing critically to **sustainable development**. The author argues that CNs are ideal to catalyse sustainable access, but the challenge of generating **reliable energy** to power infrastructure continues to pose a significant barrier to lowering costs and the ability to scale. This chapter aims to highlight the link between community networks and the broader agenda on sustainability, defines sustainable access, and explores the connection between infrastructure, energy, and Internet access, while concluding by outlining the role of CNs as a pillar of enabling sustainable access.

In her chapter on “**Community Networks: Policy & regulatory issues and gaps, an experience from India**,” Ritu Srivastava discusses the Digital Empowerment Foundation’s Wireless for Communities model, exploring the legal and regulatory challenges frequently faced by CNs in developing countries, with particular regard to spectrum allocation and management, licensing regulation, and bandwidth policies in India. The author maps out the common elements of these **challenges** among CNs and, subsequently, addresses policy and regulatory issues. Notably this chapter investigates the efficacy of creating Wireless Community Networks, Rural Internet Service Providers or community-based Internet Service Providers and explores the possibility of policies, which could help in creating widespread information infrastructure for developing countries, with a focus on India, in order to better connect the subcontinent. Importantly, Srivastava’s paper puts forward a number of **recommendations for policy-makers**, regulatory bodies, and related stakeholders. Such recommendations are organised into national recommendations and regional and international recommendations. The national recommendations include suggestions regarding how to alleviate unnecessary regulatory and fiscal hurdles on small/rural Internet Service Providers and CNs in India. The regional and international recommendations focus on creating a more enabling policy and regulatory environment for CNs, in general, and can be applied to any national context.

In their paper on “**Can the Unconnected Connect Themselves? Towards an Action Research Agenda for Local Access Networks**,” Carlos Rey-Moreno, Anriette Esterhuysen, Mike Jensen, Peter Bloom, Erick Huerta and Steve Song argue that community-based solutions to building local network infrastructure are increasingly being considered as viable alternatives to traditional large-scale national deployment models. Use of low-cost networking equipment to provide communication infrastructure built in a bottom-up manner is growing, especially in **rural areas** where connectivity is poor. While there are instances of these solutions that stand as real-world examples of ways to improve access to ICTs and provide affordable and equitable access, these models of Internet access provision are still not widely known or well accepted, usually being deemed as ‘fringe’ solutions to connectivity needs that lack widespread applicability or the potential to scale. This chapter outlines a **proposed action research agenda** and methodology for providing an evidence-based understanding of the potential role of these types of local infrastructure solutions in meeting the needs of the unconnected, as well as those on costly-metered broadband services.

1.2 Building Connectivity in a Bottom-up Fashion

The second part of this work analyses a selection of CNs, stressing the diversity of the social, economic and technical backgrounds from which CNs may originate as well as highlighting that very heterogeneous models that may be utilised to establish and maintain CNs. The cases presented in this section witness the variety of CNs, demonstrate that these initiatives may be developed in many different environments and suggest the interest of promoting further research on the matter.

Erik Huerta Velazquez and Karla Velasco's chapter on "**The Success of Community Mobile Telephony in Mexico and its Plausibility as an Alternative to Connect the Next Billion**" opens the second part of this book. The authors introduce a framework for the design and instrumentation of Community Mobile Telephony (CMT) from a Mexican perspective but applicable to other regions. Particularly, this chapter describes the case of Telecomunicaciones Indígenas Comunitarias A.C. and **Rhizomatica** whose CMT began operating in 2013 in Talea de Castro, Oaxaca, under a private network scheme and using a segment of spectrum, acquired for free-and-non-profit use. The case analysed in this chapter demonstrates that, under a new technical, economic and organizational scheme, it was possible to offer, in a sustainable manner, mobile services in commercially unfeasible localities. After 3 years, since inception, the system covered eighteen localities of between two hundred and three thousand habitants. As Huerta and Velasco emphasise, these data confirm not only the viability of the model but also the possibility to expand it to communities without **mobile service**. Moreover, this experience paved the way for the creation of a new framework among traditional operators, which allowed them to connect rural locations, previously deemed inviable. Importantly, the success of the project has given way to a **new legal framework** and a modification in spectrum administration, which, for the first time in Mexican history, assigned a portion of GSM spectrum for social purposes. The success of the Mexican case proves that Community Mobile Telephony is a **plausible option** that should be embraced to connect over 2 billion people without affordable mobile coverage and the 700 million with no coverage at all, by supporting communities to build and maintain self-governed and owned communication infrastructure.

In their chapter on "**Community-led Networks for Sustainable Rural Broadband in India: the Case of Gram Marg**," Sarbani Banerjee Belur, Meghna Khaturia and Nanditha P. Rao argue that, to bridge the digital divide facing rural India, a cost-effective technology solution and a sustainable economic model based on community-led networks is needed. **Gram Marg Rural Broadband** project at IIT Bombay, India has been working on both these aspects through field trials and test-bed deployments. The authors critically argue that, even if the connectivity reaches rural India, the network infrastructure would not be able to sustain itself at the village level, without a **sustainable economic model**. This chapter analyses the findings of the impact studies performed by the authors, which have exposed the need for community owned networks. Conspicuously, the study reveals that villagers have a clear understanding that they can save time and money, when Internet connectivity reaches the village. However, the adoption of traditional Internet access provision paradigm was not sustainable. On the contrary, villagers suggested community-led networks would enable them to "own Internet" and, to this end, the **Public-Private-Panchayat Partnership** (4-P) model was developed. In this context, the Panchayat, which is the local self-government – which operates at the village level according to the Indian decentralised administration system – takes **ownership of the network**.

The partnership enables the network to be community-led for effective decision making and prioritising services based on the needs of the villagers. The public-private partnership enables Internet connectivity to reach the village from where the management is taken over by the Panchayat that supports the investment for the local network infrastructure, at the village level. Local youth known as **Village Level Entrepreneurs (VLEs)** invest, maintain the network and generate revenue. The authors stress that the model ensures a decent and sustainable **return on investment** for the Panchayat and defines a nominal user subscription cost. It also considers expected future growth in demand and related cost dynamics. This chapter offers a crucial perspective on the relevance of revenue generation and sharing, stressing that CNs can be economically sustainable, providing incentive for connectivity expansion and empowerment of local villagers.

In his chapter on “**Comparing Two Community Network Experiences in Brazil**,” Bruno Vianna describes two installations of community networks in two different environments in the state of Rio de Janeiro, Brazil. The first case study, completed in 2015, was established in the **rural village** of Fumaça. The development of this CN was made possible thanks to a grant from Comotion Wireless and was built by a team of volunteers together with the members of the local community. To date, the network remains operational, providing free and open access to the Fumaça community. The second one was established in the Maré Complex, an area concentrating a considerable number of **favelas** in the city of Rio de Janeiro. It was made possible through an open call for workshops from the Rio de Janeiro state government, and was implemented by the students who participated in the weeklong course and were, for the main part, coming from the local favelas. The two cases provide interesting information regarding the potential for CNs in the global south, highlighting the possibility that such initiative can have with regard to **capacity-building, empowerment** and the creation of new opportunities for **youngsters**.

In her chapter on “**Beyond the Invisible Hand: the Need to Foster an Ecosystem Allowing for Community Networks in Brazil**,” Nathalia Foditsch provides a useful complement to the discussion started in the previous chapter by Bruno Vianna, arguing that the debate over CNs is not new in Brazil but needs to gain momentum again, in order to overcome some obstacles. Notably, the author emphasises that promoting a **favourable ecosystem** is a challenge that goes beyond the technical aspects of deploying and managing such networks. Recent advancements show signs of an increasingly encouraging environment for CNs, but a lot remains to be done. This chapter briefly discusses some **challenges** and new **regulatory developments** in Brazil and explores how the work of the IGF Dynamic Coalition on Community Connectivity might contribute to the promotion of an ecosystem that facilitates the establishment of CNs.

In her chapter on “*Diseño e Implementación de una Aplicación Web para la Visualización Mundial de Despliegues de Redes Comunitarias*” (**Design and Implementation of a Web Application for the Global Visualization of Community Network Deployments**), Maureen Hernandez stresses that it is currently hard to obtain systematised information regarding the existing CN deployments around the world. Nothing the lack of a database or repository providing basic **information about CNs**, such as the name, localization, and contact person of these initiatives, the author proposes to remedy to this lacuna through the development of technical tool. This chapter proposes to collect data on CNs to organise them to facilitate interactions among stakeholders and take advantage of the lessons learned,

instead of letting each community starting from zero. Hernandez argues that such effort may be feasible based on the outcomes that have been developed, to date, by initiatives like the UN IGF Dynamic Coalition for Community Connectivity or the research group Global Access to the Internet for All (GAIA), from the Internet Research Task Force (ITRF). The paper argues that the ability to **visualise** information about CNs into a unique tool may be a crucial factor not only to promote and inspire more deployments but also to understand how far these initiatives have come and how different their characteristics may be. In this perspective, Hernandez proposes a “**Community Connectivity Map**” with the aim to systematise and visualise data about the largest possible number of CNs.