

# GLOBAL INFORMATION SOCIETY WATCH 2018

## *Community Networks*



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

# Global Information Society Watch

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

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# SOUTH AFRICA

## CHALLENGING INEQUALITY IN POST-APARTHEID SOUTH AFRICA: A BOTTOM-UP, COMMUNITY-LED BUSINESS MODEL FOR CONNECTIVITY



### Zenzeleni

Sol Luca de Tena and Carlos Rey-Moreno  
zenzeleni.net

## Introduction

South Africa is a beacon of industrial capacity and strong political development in Africa. Despite this, the country has still not managed to deal with the devastating socioeconomic legacy of apartheid, and while politically emancipated it has been unable to escape the dubious honour of being one of the most unequal societies in the world.<sup>1</sup> Around 55.5% of the population continues to live in poverty,<sup>2</sup> with this number reaching 80%<sup>3</sup> in the rural areas. Wealth and poverty are largely racialised, with a majority poor black African population often unable to afford daily essentials or access resources, decent education or basic services.

Poverty and inequality in South Africa are also expressed through the digital divide. This divide is a reflection of the historic and current socioeconomic reality, but it also threatens future development: people and communities who lack connectivity, digital opportunities and associated skills and resources will be further marginalised over time unless interventions are made to change this.

Community networks may present an avenue to challenge socioeconomic disparities by offering rural and impoverished communities a chance to own, manage and sell their own affordable, reliable communication services. Zenzeleni – a community network that is based in one of South Africa's poorest provinces – is demonstrating the developmental power of community networks by enabling the creation of local businesses and allowing communities to participate in the development of their own communities.

Centred around the specific needs and values of their respective communities, community networks such as Zenzeleni are powerful tools that can offer communities much needed connectivity, infrastructure, skills and revenue. They are a mechanism through which localities and people who are structurally marginalised from the greater economy can participate in the economy as equals, and on their own terms. This last fact – that community networks allow communities to organise themselves according to their own priorities and needs, and distribute their benefits in the same manner – means that community networks offer an appealing alternative to top-down development and public policy.

This report discusses the context, approach and challenges faced in setting up Zenzeleni in an attempt to inform and encourage others to learn from and expand on its experience.

## Policy, regulatory and telecommunications context

South Africa's telecommunications regulatory framework includes a number of concessions which can be used for the purposes of greater social inclusion. These exemptions are significant in that they create some flexibility for community networks to establish themselves with fewer bureaucratic burdens and costs, and enable them to play a role in the telecommunications sector. Perhaps the most important is the formal licence exemption for operating certain types of telecommunications infrastructure and services. Zenzeleni has made use of this exemption.<sup>4</sup>

South Africa also offers a licensing exemption with regards to Wi-Fi and, recently, television white space (TVWS) spectrum, also allowing for higher radiated power than in many other countries. In the event that a community network runs out of channels in its licence-exempt spectrum, the national regulator, the Independent Communications Authority of South Africa (ICASA), also allows a very flexible and low-cost fee structure in other bands that could be used in backhaul links.

While crucial, this flexibility is nevertheless not sufficient to allow communities to establish

1. Sulla, V., & Zikhalil, P. (2018). *Overcoming Poverty and Inequality in South Africa: An Assessment of Drivers, Constraints and Opportunities*. World Bank. [documents.worldbank.org/curated/en/530481521735906534/Overcoming-Poverty-and-Inequality-in-South-Africa-An-Assessment-of-Drivers-Constraints-and-Opportunities](https://documents.worldbank.org/curated/en/530481521735906534/Overcoming-Poverty-and-Inequality-in-South-Africa-An-Assessment-of-Drivers-Constraints-and-Opportunities)
2. Using the upper-bound poverty line (UBPL). Statistics South Africa. (2017, 22 August). Poverty on the rise in South Africa. [www.statssa.gov.za/?p=10334](http://www.statssa.gov.za/?p=10334)
3. Nassen Smith, M. (2017, 16 October). "Confronting Inequality": A report on IFAA Conference. *Institute for African Alternatives*. <https://ifaaza.org/2017/10/16/confronting-inequality-a-report-on-ifaa-conference>

4 South Africa does not have specific legislation for community networks.

community networks. Several other obstacles pose a barrier. For instance, communities in rural areas are unlikely to know the details of national telecommunications policies, or even if they do, they are unlikely to understand the complex language of public policy and regulations, or the technical processes needed to access opportunities. Such communities may also not have the access to resources to allow them to travel to regulatory offices to complete application forms, or to contract the legal services needed to ensure they are compliant with various regulations, or the technical services needed to establish the infrastructure to launch their community network. A complex set of knowledge and skills are required to understand and exploit these opportunities.

For its part, Zenzeleni has had a wide range of collaborators who stepped in to assist in overcoming these obstacles. They include organisations such as the University of the Western Cape (UWC)<sup>5</sup> that helps build evidence, Ellipsis Regulatory Solutions<sup>6</sup> which offers expertise to navigate the regulation landscape, the Association for Progressive Communications (APC)<sup>7</sup> and the Internet Society (ISOC)<sup>8</sup> who provide support through their networks and resources, and other community networks around the world with whom to share experiences, among others. These collaborations have raised the profile of Zenzeleni, accessing assistance for it at national and international levels. Their joint advocacy has been critical in getting community networks recognised as mechanisms for positive change and connectivity in South Africa, and it is partly through their advocacy that in May 2018 the South African government's Department of Telecommunications and Postal Services (DTPS) formally indicated its intention to collaborate with and support Zenzeleni during its annual budget speech in parliament.<sup>9</sup>

### Zenzeleni: Generating capital and opportunities through connectivity

Zenzeleni currently provides affordable, reliable connectivity within several communities in the rural Eastern Cape province of South Africa, specifically in Mankosi, Mcwasa, Nomadolo and Zithulele. Like many other areas in the Eastern Cape and other parts of South Africa, these communities were deliberately

and systematically underdeveloped by the racist and oppressive colonial and, later, apartheid regimes. They are characterised by extremely high unemployment, deep levels of poverty, high rates of out-migration by people of economically active ages, and a lack of economic infrastructure beyond the presence of general stores (which stock very basic products) and some limited tourist accommodation. The result is that today, more than 20 years after the fall of apartheid, unemployment in the area is around 98%.<sup>10</sup> Most residents live on around USD 1 per day, relying on government old-age and childcare grants or on remittances from relatives working in urban areas.

Telecommunications constitutes a major portion of the monthly expenses of these village residents – around 25% of monthly costs, according to a five-year study by UWC.<sup>11</sup> This is partly a consequence of the need for telecommunications in a context where families are so dispersed around the country, and also because the telecommunications tariffs for the area, charged by formal service providers, are some of the most expensive in the country.

To illustrate: residents typically buy the smallest prepaid voucher, ZAR 5 (South African rands)<sup>12</sup> at a time, which equates to around five megabits (MB)<sup>13</sup> of data, or six minutes of call time. Better rates can be accessed by paying for moderate monthly contracts – such as ZAR 199 for five gigabits (GB) or ZAR 499 for 20 GB<sup>14</sup> – but both are unaffordable to local residents. The costs are exacerbated by the fact that vouchers in such areas retail through local distributors at a 40% margin (hence a ZAR 5 voucher is actually sold for ZAR 7). Residents also have to pay an additional ZAR 5 to recharge their phones – possibly at a neighbour's or local shop – as many do not have electricity at home. Yet once they have purchased vouchers and charged phones, residents then struggle with unreliable network coverage.<sup>15</sup>

It is estimated that 15 communities within the broader area around Zenzeleni collectively spend over ZAR 20 million (over USD 1.5 million) on

5 <https://www.uwc.ac.za>

6 <https://www.ellipsis.co.za>

7 <https://www.apc.org>

8 <https://www.internetsociety.org>

9 Ndabeni-Abrahams, S. (2018, 17 May). Budget Vote 32 Address by Ms. Stella Ndabeni-Abrahams, Deputy Minister of Telecommunications and Postal Services. *Africa Newswire*. <https://africanewswire.za.com/deputy-minister-stella-ndabeni-abrahams-telecommunications-and-postal-services-dept-budget-vote-2018-19>

10 <https://wazimap.co.za/profiles/municipality-EC155-nyandeni>

11 Rey-Moreno, C. (2015). PhD dissertation, Rey Juan Carlos University.

12 The currency conversion at time of writing was ZAR 1 = USD 0.08, so ZAR 5 is USD 0.40.

13 Costs from field research and compared with Stolp, J. (2017, 16 May). Feeling ripped off about airtime? You probably are. *Fin24*. <https://www.fin24.com/Tech/Opinion/feeling-ripped-off-about-airtime-you-probably-are-20170516>

14 [www.shop.mtn.co.za/crs/browse/productFilter.jsp?categoryName=SIMOnly](http://www.shop.mtn.co.za/crs/browse/productFilter.jsp?categoryName=SIMOnly)

15 Rey-Moreno, C. et al. (2016). An in-depth study of the ICT ecosystem in a South African rural community: unveiling expenditure and communication patterns. *Information Technology for Development*, 22, Supplement 1, 101-120. <https://www.tandfonline.com/doi/full/10.1080/02681102.2016.1155145>

telecommunications annually.<sup>16</sup> Much of this capital is not retained locally: it flows back to large telecommunications companies in urban centres, leaving little capital or other value within the impoverished communities.

Zenzeleni, however, creates local internet service provider (ISP) businesses that allow the communities to retain their spending internally, and hence enables them with affordable access to digital resources and a local source of income.

### Building up a community network

Zenzeleni (“Do it yourself” in isiXhosa) was born in 2013 through a friendship between a UWC doctoral student doing action research in the area and a local community activist. It led to a partnership between UWC and the local tribal authority of the Mankosi community. The project was co-developed and co-created over a six-year period, during which local buy-in and support were nurtured and developed. The project has evolved by placing the community at its centre, and by responding to the community’s self-defined needs and opportunities.

At first Zenzeleni was simply a local wireless intranet providing free voice services between analogue phones connected by solar-powered routers. It later included an external connection to the internet via a 3G modem to enable these phones to make calls to national numbers. During the process, the community recognised the opportunity for the solar station powering the routers to also charge phones, and they began to offer mobile phone charging services from these routers at a cheaper rate than the local retail shops (ZAR 3 rather than ZAR 5). It proved a valuable opportunity for the community to generate income.

These interventions resulted, among other things, in a training programme where 12 young local people were guided to use the internet to apply (successfully) for national tertiary education grants. It was a massive achievement in an area where completing secondary education is rare.

Until this point all of these interventions were conducted under the auspices and funding of UWC research. Parallel techno-economic and social studies were undertaken to gauge the barriers that the community experienced in accessing, using and benefiting from telecommunications.

In 2014 Zenzeleni established a local cooperative with full ICASA licence exemptions to operate and

offer communication services. However, efforts to access towers – both public and private – and to collaborate with existing telecommunications networks to access fibre were unsuccessful.

Yet other successes were achieved: in 2016 Zenzeleni was recognised internationally and received an ISOC Beyond the Net grant;<sup>17</sup> in 2017 it was a finalist in the Mozilla Equal Rating Innovation Challenge;<sup>18</sup> and also in 2017 it was awarded the South African national award for Best Innovation with Social Impact.<sup>19</sup> Funds from these awards allowed Zenzeleni to create its own wireless backbone; at first its internet connection was to the National Research and Education Network via the University of Walter Sisulu (60 km away from Mankosi as the crow flies).

At the end of 2017, Zenzeleni secured its first private sector client (or anchor tenant), the local branch of a large corporate – and through a like-minded company, Zenzeleni was able to secure uncontended access to a fibre connection. Apart from servicing its four communities, Zenzeleni now offers internet to seven local businesses and three schools.

Currently, Zenzeleni’s solar-powered, wireless network can carry up to 200 megabits per second (Mbps). While there are still limited connection points (or hotspots) to the network, the average monthly traffic has been 1.5 terabytes (TB), with over 5,000 different devices connected to the network. Since devices are often shared by several people in a household, the actual number of users is higher. Recently Zenzeleni has started selling uncapped data vouchers which are active for a month. This voucher model is still being tested. Connectivity for local businesses and schools occurs at a monthly fee.

### Governance structure: A tool for integration and development

As Zenzeleni has grown, it has evolved two parallel functions: an umbrella non-profit company (Zenzele-ni), and the local community-owned and operated ISP (the Mankosi cooperative).

The members of the cooperative are elders – men and women – from different community villages. Among other things, they decide who hosts mobile charging stations and hotspots, as well as who sells the vouchers. They have met monthly since 2013 to understand and shape Zenzeleni, and to use it to contribute to the development of their communities and families. In local Xhosa culture the elders

<sup>16</sup> Based on extrapolating the numbers in the conclusion of Rey-Moreno, C. et al. (2016) to the population of the communities in Nyandeni ([www.wazimap.co.za/profiles/municipality-EC155-nyandeni](http://www.wazimap.co.za/profiles/municipality-EC155-nyandeni)) and King Sabata Dalindyebo ([www.wazimap.co.za/profiles/municipality-EC157-king-sabata-dalindyebo](http://www.wazimap.co.za/profiles/municipality-EC157-king-sabata-dalindyebo)).

<sup>17</sup> <https://www.internetsociety.org/beyond-the-net>

<sup>18</sup> <https://challenge.equalrating.com>

<sup>19</sup> University of the Western Cape. (n/d). Zenzeleni Project Wins Social Innovation Award For Connecting Rural Community. <https://www.uwc.ac.za/News/Pages/Zenzeleni-Project-Wins-Social-Innovation-Award.aspx>

are responsible for caring for their community's well-being, and this social vision is as essential to Zenzeleni's sustainability as the economic and technical aspects. The cooperative's constitution clearly states the intention for the business to develop the area and grow opportunities for their children. In the words of one of the cooperative's directors, who spent his life working in the mines: "I didn't know that you could get a little bit of money without having to go outside of the community to work hard. That is the future I want for my children".

The non-profit company acts as a support mechanism for the cooperative and as a bridge between the local community and the established telecommunications sector. It has four directors drawn from a range of relevant fields and experiences. Their role is to guide the cooperative through a myriad of issues including acquiring licence exemptions, brokering deals, accessing the relevant technology, building resources, gathering evidence, advocacy, managing the network, accessing funding, and creating partnerships, among other things. These tasks are all necessary for Zenzeleni to operate in the telecommunications sector; yet they are totally removed from the daily lives of the community. In rural South Africa, where there are often no services, even the simplest tasks take days of travel and frustrations with systems which do not cater for communities. The intention is that one day the cooperative will have the skills, resources and access to online services to undertake these tasks autonomously. For now the non-profit company is required as a support structure.

At this stage the cooperative generates enough income to pay for its own bandwidth, replace infrastructure and grow its network by adding more access points. As it expands, so will the revenue available to the cooperative. The non-profit company has until recently run on a volunteer basis, with intermittent support from grants. Zenzeleni's ecosystem (a non-profit company and different cooperatives providing internet access) will reach sustainability when several cooperatives serving different communities within regions contribute a fee towards maintaining a network that is treated as a common-pool resource and managed by the non-profit company.

This year Zenzeleni will test its ability to scale towards sustainability by expanding to a new area and seeding a new cooperative. This is partly funded by the South African Department of Science and Technology and the Technology Innovation Agency, and will allow Zenzeleni to undertake a more systematic – and resourced – incubation process. Key to this is setting up systems and transferring skills for cooperatives to take a further step toward autonomy.

Here there is a strong emphasis on the inclusion of women in taking the lead in the new cooperative and also further recognising their role within the Zenzeleni ecosystem. Another key focus area for Zenzeleni is defining its common-pool resource (or commons) approach<sup>20</sup> to managing its network infrastructure.

Essentially, the commons is an approach through which the network assets are jointly owned by all who utilise them. New users can connect to the existing network, and the costs of maintaining and upgrading it are shared. This is significant, as the start-up and fixed costs of a network are very high, whereas those of increasing bandwidth or expanding a section of the network are proportionally much lower. This allows users to avoid duplicating infrastructure and services. It also allows them to access economies of scale as a large body made up of smaller individual entities. Since fixed costs are shared among all users, as more users join the network, costs become increasingly lower for all.

Partnerships with various players in the telecommunications sector are important to increase the efficiency and benefits of the commons approach. There has been overwhelming interest in Zenzeleni from other communities in rural and urban townships<sup>21</sup> as well as from local businesses and institutions. The integration of different players, with communities at its centre, is an opportunity for positive social, racial and economic integration in the South African context. However, one of Zenzeleni's challenges is to offer a system that promotes benefits for all, but also accounts for socioeconomic differences in the country so as not to further propagate these.

### A model for co-creation

Zenzeleni's community-centred model holds significant promise to address the digital divide. In these rural and impoverished areas, traditional technology interventions fail. For instance, donations of computers to schools in the area have seen the technology remain unused, as people do not have the skills to use them, or due to a lack of electricity or internet; or they are stolen soon after being donated, since such technology is a valuable resource in an impoverished area. The failure of such interventions, however, is often due to poor or non-existent consultation with the so-called beneficiaries. Zenzeleni has been different. It is a model of slow co-creation with and through the

<sup>20</sup> Zenzeleni bases its common-pool resource management on the model developed by guifi.net, which services more than 34,000 active nodes. <https://guifi.net>

<sup>21</sup> South African term for informal settlements found outside cities where people often live in tin shacks and where there are few services.

community, and its network has been cared for and used.

Integration will require time and recognition of different ways of working. Zenzeleni offers hope that there is an alternative to isolation and marginalisation. Nowadays it is common to see people huddled around Zenzeleni hotspots: Bongani,<sup>22</sup> a boy watching soccer and analysing each players' moves intently to "up his skills"; young Lundi's face suspicious at first, then lighting up when shown how to access maths learning support videos; Siphoh, a keen local rapper, searching the online music world and finding something of himself in others. Sharing content that reflects the identity of the amaXhosa is a next step... each one a step toward a more connected and integrated South Africa.

## Conclusion

Zenzeleni's case shows how economically marginalised communities that otherwise depend on government grants and remittances can, through a community network, both access and own high value services in South Africa. Internet connectivity offers access to resources that are otherwise not available in these communities, and the new ISP business provides poor people with a new income stream.

Through ownership, transparency and collaboration, Zenzeleni also shows that technology can be readily accepted and integrated into rural life. It has the potential to offer equal resources to all people of South Africa, at least online. However, the effective uptake of such technology depends foremost on input and acceptance from the community. It is important to move slowly, to build trust, acceptance and knowledge, and to seed and incubate the ISP businesses.

Collaboration has also been important to overcome the multiple legal, technical, financial and social barriers experienced by communities. An approach responsive to challenges, research and a multidisciplinary team have been critical to the success of Zenzeleni.

All of the above has not happened without challenging the status quo in telecommunications and norms around development and transformation. But then, things cannot change and stay the same.

This year Zenzeleni will test its model by scaling to new areas. We are working hard for this vision, and following in the words of another local cooperative director: *Sifuna uZenzeleni anwenwe nje ngomlilo* – "We want Zenzeleni to spread like fire."

## Action steps

The following key steps are necessary to strengthen Zenzeleni and community networks generally in South Africa:

- *Implementation and growth:* Zenzeleni needs to answer the pull from communities that want their own community network. This will require some seed funding and a bigger support team (seed funding, partnerships and volunteers are welcome).
- *The importance of local relevance and international collaboration for community networks:* Core to the sustainability of the community network is maintaining its relevance to the local people and context. This requires ongoing reflection and work. Likewise, participating in community networks regionally in Africa and globally offers us a chance to develop a robust system of peer-to-peer support and sharing of experiences to sustain our community network model. This requires ongoing participation in and nurturing of international people networks.
- *Collaboration with the South African government in its policy response to community access:* It is important for community networks in South Africa to engage with the government in its policy response to local-level access. This will help create more innovative and responsive policies that enable the potential that community networks offer for South Africa and the greater region.
- *Enabling communities to access infrastructure, spectrum and regulation:* A key regulatory change relates to infrastructure sharing and cutting red tape. Sharing public and private telecommunications towers, services and spectrum – and simplifying the bureaucracy to access them – will increase the potential for communities to deploy their own community networks, and amount to significant resource and cost savings for communities and the sector.
- *Engage and support the community:* Finally, it is worth restating a simple fact about community networks: they are for the community. Many of the past community access programmes such as telecentres or e-schools have failed due to a lack of consultation with their beneficiaries, poor participation of the communities in the initiative, and a lack of proper technical and other support. Programmes need to allow communities to determine their priorities and enable them to own and operate their community assets – they should not just be passive customers paying for access to the internet. Long-term capacity building and mentorship support are essential.

<sup>22</sup> Although these examples are real, the children's names have been changed to protect their privacy.

# 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

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