



Affordable internet for everyone: A village in South Africa leaps across the digital divide

Zenzeleni Community Networks is the first internet provider in South Africa owned by a cooperative. It builds and manages its own network. Villagers have low-cost access to the internet and use it to develop their community.

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The first thing Nontsokolo Sigcau does when she wakes up is glance at her smartphone. The grandmother checks to see if the internet connection is working. "That's one of my duties," she explains, since the central hotspot for her village is installed on her property. "If I don't have access, then my neighbors are offline, too," she says—and they've been offline long enough.

Sigcau's house sits on one of the many hills of Mankosi, a community of 12 villages on South Africa's Wild Coast. About 5,000 people live here. Sigcau's neighbors are widely scattered



Mankosi is a rural community in South Africa.

in traditional, grass-roofed round houses, sometimes supplemented by more modern rectangular houses with tin roofs. Cows graze in the vast grasslands, and farmers cultivate

small fields. It's a long way to the nearest paved road; dirt roads and footpaths wind through the community.



Water comes only from communal taps.

The area is one of the poorest in South Africa. During Apartheid, it was part of the homeland Transkei, but even after the transition to democracy in 1994, development has been slow to arrive. It is only in the past few years that the houses have been connected to the power grid, and water is still only available from communal taps that several households have to share. In the past villagers had to walk a long way to find a cell phone signal, Sigcau says. "Those were dark times. We were cut off from the world."

Zenzeleni means: Do it yourself!

But all that is history now. "We helped ourselves," says Sigcau, her face beaming. Together with other villagers, she founded Zenzeleni Community Networks, South Africa's first internet service provider owned by a cooperative and not, as is usually the case, one of the large telecommunications companies. Zenzeleni means "do it yourself" in the isiXhosa language. At the beginning, Sigcau says, she knew nothing about the internet. It is a "wonderful invention," she says, allowing people to do almost everything online.

Sigcau is eager to explain how her system works. On the roof of the small store on her property, a solar panel is installed to power the hotspot. Sigcau points to a round antenna on the wall of the house. "It receives the signal from our tower and relays it to my hotspot, which then shares it with my neighbors," she says. Her cooperative's wireless mesh network consists of several interconnected nodes that transmit the signal throughout the sprawling village.

Sigcau enters the store and walks past sacks of maize meal and plastic containers of cooking oil into a storage room. A wooden box houses the modem and several batteries, which provide backup for the power outages that are almost a daily occurrence in South Africa. "There can sometimes be a loose connection here, or a new battery is needed," Sigcau says. If she can't restore the connection, she calls one of the network's three technicians.

Sinethemba Lukozi is one of them. On this day the 33-year-old is in Nomadola, some 40 kilometers away, inspecting one of the network's two cell towers. Secured with a rope, a helmet on his head, he climbs up and checks the cable connections. The signal is transmitted from the university campus in the next largest town, Mthatha, where the cooperative's network has been connected to the fiber-optic network since 2017. The mast stands high on a hill halfway to Mankosi. "Line of sight is key for this type of network," Lukozi explains. He used to work in a supermarket in Mthatha. The fact that he can now work in his own village and contribute to its development fills him with pride. "Our parents were not educated. We hardly had any educational opportunities either. We want our children to find their way in the digital space. In the city, I learned how important that is."

"I learned new recipes for my catering service on the internet."

Lisa Maliwa, resident of Mankosi



"I could apply for a job in the city with my new knowledge, but I prefer to work here in my community."

Sinethemba Lukozi, computer technician



"We will now apply online for secondary school."

Students Sinobom, Bulela and Sandisiwe



"I only used a computer for the first time at university. By then, my students had already been familiar with the digital world for a long time."

Vuyani Babala, head teacher



Zenzeleni Community Networks paid for his basic technical training and also sends him to advanced training classes. That's part of the model: The eight-member cooperative to which Sigcau belongs owns, governs, operates and maintains the network. At the same time, a non-profit organization has been set up to provide education and training, collect funding and act as an advocacy group.

Lukozi has just returned from a six-week course in Cape Town. It's not something he would have dared to dream of in the past. "I learn something new every day, also how to keep the records for the work. It is opening my mind. I have a way forward now."

It all began ten years ago with a meeting between two young men: local activist Masibulele Jay Siya and Carlos Rey Moreno, a student from Spain. At the time, Moreno was studying Information and Communication Technologies for Development, or ICT4D, at the University of the Western Cape and came to Mankosi for a case study. "I told Carlos that we were interested, but only if the local population would also benefit," recalls Siya, who was working for a local development organization at the time.



The solar-powered computer lab on the school campus.

That's how the idea came about to build an independent telecommunications network that would be reliable and inexpensive. At the time, villagers could only receive mobile signals on certain hills, and even that connection was not stable, Siya says. To make matters worse, telecommunication costs and data prices in South Africa are more expensive than in almost any other African country. "The costs were ridiculously pricey for local people to afford," Siya says. At the time, they amounted to more than one-fifth of the average income. Most residents here live on social grants, such as old age pensions or child support grants. The few cell phones available were used by everyone. "Anyone expecting a call or wanting to make a call themselves had to book an appointment," Siya explains.

Nevertheless, not all residents were convinced at first about the idea of a community network, without the involvement of one of the big telecommunications companies. "The model simply didn't exist at the time, and most didn't believe it was possible," says Siya. Surprisingly, it was the older generation that supported him in his venture. "They told me very clearly that although they didn't understand anything about technology, they trusted me and wanted to try it, so that their children and grandchildren would one day have it easier."



The village residents, gathered around the heart of the Zenzeleni community network.

The creation of this community network was "historic," emphasizes Shaun Pather, ICT4D professor at the University of the Western Cape and chairman of Zenzeleni's nonprofit organization. The South African government launched a plan in 2007 to enable the majority of citizens to "enter the information age." But, as is so often the case, implementation has been slow. According to the latest survey by the federal agency Statistics South Africa, at least one person in around 63% of households has access to the

internet. This figure also includes those who use public hotspots. Only a minority have a connection at home; more than half go online via their cell phone.

The digital divide remains deep

Globally, 2.9 billion people, a third of the world's population, are estimated to suffer from the so-called digital divide, even though 95% live within range of a mobile network. Universal access includes, among other things, being affordable, Pather stresses. "Access on its own is meaningless. You might have access, but it's not useful to you when you can only afford it for a short bit in a month or you don't have the skills and the know-how." The high costs in South Africa are due in part to price agreements among the large telecommunications companies, he says. "If you're making a sufficient income out of the urban areas and from those people who can afford it, it's not a pro poor situation. There's nothing that will incentivise them to worry about the village in Mankosi."

In 2014, Zenzeleni Community Networks became the first cooperative to receive a license from the national regulator, the Independent Communications Authority of South Africa (ICASA). A few local businesses, including a backpackers' hostel, have subscriptions, and residents buy vouchers that are valid for one month. A flat rate costs 25 rand (about 1,40€).

For that price, a consumer can't get even 240MB from the big providers.

Another advantage is that the money does not go to corporations, but stays in the villages. The members of the cooperative in Mankosi sell around 350 vouchers every month, and almost twice as many during vacation periods when there are many young people in the village. For every 20 vouchers sold, the sellers receive 150 rand (about €8.40), and the rest is

invested in the maintenance and upkeep of the network.

Now that affordable access to the internet has been established, the project founders want to make sure it is also used for community development. The University of the Western Cape is providing scientific support for the project. A study on the impact of the network has just been completed, says Shaun Pather. He and his colleagues are still analyzing the data, but he says it is already clear that the network is



As a member of the cooperative, Sigcau answers questions from her neighbours.

having an impact, making it easier for villagers to search for jobs and communicate with the government, for example.

A big step forward, he says, is the establishment of a community solar-powered computer lab, which was set up about a year ago. It's well established in the scientific literature that such a communal place strengthens social cohesion, Pather notes. There is no other rural community of this kind in South Africa that has both affordable access to broadband internet and now a solar powered computer lab for education. "This is historic," he emphasizes.

The computer lab, with its rooftop solar array, is housed in a building partly made of a converted shipping container on the grounds of the local school. It stands in contrast to the other facilities, which, as at all government schools, are meager, especially in rural areas like this one. For example, there is no sports field and no indoor bathrooms—only pit-toilets—for the 595 children in grades one through nine. That only serves to increase the enthusiasm for the new computer room.



Sigcau checks the cable connections and the batteries.

Internet competence is being expanded

Inside, Yoleka Libalele teaches a few students. She has designed a separate course for the rural population in Mankosi, starting "from zero," she says. "They have smartphones, but their knowledge is extremely limited." For example, they may be able to open a link, but they don't know how to search for specific information. They watch music videos on YouTube but are not aware of digital learning programs. Email programs are also new to them; most have only used messaging apps. That's because very few families in this area have their own computer.

Seventh grader Bulela Qatsi is typing a letter of application into a word processing program. "I've already gotten a little faster. At first, it looked like I was picking beans," she says, somewhat embarrassed. Now not only is she typing faster, but she can also save texts and knows the basics of spreadsheets. The girl's face beams. "With these skills, I'll soon be able to apply for secondary school and maybe later for university," she says. "And I can do it all online, without having to travel there."

Principal Vuyani Babala says his students' grade point average has improved, including in English. Those who don't understand something can use online translation programs, which now also exist for their native language, isiXhosa.

And it's not just the students who benefit from the computer lab. "Our teachers have received laptops from the Ministry of Education, but some of them were afraid to use them until now," Babala says. They, too, are now being taught. He himself has just learned how to protect data from unauthorized access and how to manage passwords. The small lab with 11 desktop computers and 20 laptops is always busy. In the mornings, students from the fifth grade upwards are taught on a rotating basis; in the afternoons and on Saturdays, it is open to the villagers. A lot of support is still needed, says Yoleka Libalele. The most common requests are for copies, printouts, help with online job searches and, above all, online forms for applying for government grants. In the past, residents of Mankosi had to drive to Mthatha, about 70 kilometers away. The journey takes two hours on mostly unpaved roads, and the fare is 200 rand (about €11), roughly equivalent to one-tenth of a villager's state pension. That's the money they can now save.

Internet access can open up business opportunities

The computer lab also hosts courses for those who have a business idea. Lisa Maliwa, 31, took part. Her idea: a catering service for big events in the village. She is already a good cook, she says, but there is always a lot to learn. "For example, I learned how to bake muffins via YouTube tutorials." Before that, she knew almost exclusively traditional dishes. In the course, she also learned how to calculate income and expenses and how to use social media for advertising. She has already landed her first job.



The community celebrated the opening of the school's computer lab.

But the internet is not only for young people, emphasizes Nontsokolo Sigcau. Together with other members of the cooperative, she cultivates a vegetable field just a few meters away, on the slope in front of the computer room. "When we have a good harvest, we take a photo and spread it via WhatsApp or social media," she says. Local produce is cheap, and

customers come from the area. Sigcau snaps her fingers several times to illustrate how quickly spinach, beans and sweet potatoes sell out.

Today, however, Sigcau isn't working in the field. She's dressed up. The lab is finally being formally inaugurated a year after it was commissioned—the Covid pandemic had delayed the ceremony. The old woman walks into one of the classrooms where the villagers have gathered, some in ceremonial dress, others in work clothes and rubber boots. Professor Pather, co-founder Siya, local politicians and representatives of traditional authorities have also come. On this day, the Zenzeleni Community Network celebrates what it has already achieved, with dancing, singing and many speeches.

The focus is also on sustainability so that the network can continue to grow. As Sigcau puts it, "There is nothing for mahala," that is, for free. Their cooperative has set a price of 50 rand (about €2.80) a month for students, a computer course for adults costs 350 rand (just under €20), an hour of internet costs 5 rand and a photocopy costs 1 rand.



25 rand for a monthly internet voucher.

Nothing is free

However, some of the villagers don't understand why they should pay anything, says co-founder Siya. They thought that the project was swimming in money, and in some cases there is envy and mistrust. "They were used to outside projects that offered something for free," he says. But that was not sustainable. Equipment has to be maintained and technicians have to be paid enough that they can feed their family. "To this day, not everyone has understood that. Millions of South Africans are sitting at home waiting to be given things for free. That's a problem in our society," Siya says.



The hostel has a subscription and its own hotspot

He says the government has raised expectations among the population, for example in job creation, that it has not been able to meet. Given the high unemployment rate in South Africa, even among citizens

with university degrees, people have to take matters into their own hands, Siya says. The network's goal is to open up appropriate opportunities. "It's a slow process of rethinking, towards a circular economy," he says.

To be sustainable, the network must grow

With no plans to change pricing, the network must continue to grow, Shaun Pather emphasizes. After all, it cannot finance itself with the sale of 25-rand vouchers alone. The network takes in about 15,000 rand a month, but that barely covers expenses, leaving nothing for expansion. A new mast, for example, costs 150,000 rand. "Until now, we were dependent on outside funding, but now we are creating proper business streams and units," Pather says. To help with that process, the nonprofit has just hired a general manager: Noxolo Mbokoma, a former investment banker with roots in Eastern Cape Province. She, too, has traveled to Mankosi for the celebrations, where she emphasizes that "the future is in your hands." She wants to use her contacts to help make the necessary expansion of the network possible. The key goals, she says, are greater coverage, more hotspots and more masts.



In the computer course, students learn more than just how to surf the net.

In 2019, a second community, Zithulele, was connected to the network. It is more densely populated than Mankosi, more small businesses are located there, and there is also a hospital that has indicated interest in being connected to the network. Already, more subscriptions and vouchers are sold there than in Mankosi. "Marketing is now becoming more important than ever," says Siya, who is currently undergoing appropriate training.

The cooperative network has to explain to potential customers its advantages over the large telecommunications companies. The fact that Zenzeleni Community Networks is independent cannot be overstated, Siya points out. "It means that we are really free. That for the first time we have control over our own development. That every child in this area gets a chance to learn what they want. That we have a voice and finally feel that we are part of this country and the world."

Other community networks are being set up in South Africa

The project has already inspired several other initiatives to replicate the model in South Africa, with other community

networks forming in different regions. "I am very proud of what we have achieved," says Nontsokolo Sigcau. She says she has seen many projects come and go in the past, but Zenzeleni has stayed and continues to grow. The area used to be considered backward, with no one interested in her village and its people, but now people come from all over to learn.



The new general manager encourages the community.

Her granddaughter climbs onto her lap. "She will have it better than us. She can study, and she doesn't even have to move away to do it. She can learn online," the grandmother says. She says that's what made all the hard work worthwhile, and that's what motivates the cooperative to overcome the next hurdles as well. Zenzeleni has taken her "from darkness to light." It is their legacy for generations to come.

Questions from the 100eyes community:

How was the cooperative founded, how does it organize itself, and how do decisions get made?

In 2014, Zenzeleni Community Networks was officially registered as a cooperative in Mankosi. Members were selected by the traditional authorities of the village. The cooperative consists of four men and four women who meet regularly; decisions are made collectively. As owners of the network, they are responsible for making sure the hotspots work and for selling the vouchers.

How did the community manage to get funding, especially for such a long-term project that doesn't promise quick results?

Central to this was the support of the University of the Western Cape and the establishment of a non-profit organization. With their help, the cooperative applied to foundations for start-up funds. The network won innovation awards, which also brought it more attention from donors and funders. No support came from the major mobile phone companies; the network was not even allowed to use the existing masts. The government was also skeptical at first, but the relationship with government agencies has since improved.

How does the community manage its financial resources?

The voucher sellers receive a small portion as an expense

allowance, which they can spend as they choose. The rest of the income goes toward network maintenance. Decisions about investments are made by the cooperative. The non-profit organization decides on the use of larger sums, such as subsidies for the expansion of the network, as well as the payment of personnel and training.

Is virus protection also provided for the devices, and are members also made aware of dubious offers or promises on the internet?

The PCs and laptops in the computer lab are protected with pre-installed anti-virus programs. The network's project manager takes care of maintenance and updates. Both the members of the cooperative and the computer trainer emphasize that not everything shared via social media is true, advise caution and also warn against online scams. In the lab, there is always a contact person for questions; in the village, members of the cooperative help with questions.

How can other communities replicate this model?

In South Africa, the model is already being replicated by other communities. The networks are in close contact, and there are also links to similar initiatives worldwide through the Association for Progressive Communications. Tips and advice are publicly available through the Zenzeleni website, among other places. Professor Shaun Pather emphasizes that it is easy to replicate the "recipe to develop a network." However, he says, the model needs to be adapted to local conditions. Creating a business model that is able to sustainably run the network is "really the hardest part," he says.

The project was funded by the European Journalism Centre, through the Solutions Journalism Accelerator programme. This fund is supported by the Bill and Melinda Gates Foundation.

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