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| **English only**  **DELAYED CONTRIBUTION** |
| Question 5/1: Telecommunications/ICTs for rural and remote areas | | |
| SOURCE: | Association for Progressive Communications (APC) | |
| TITLE: | Economic and social development enabled by complementary connectivity approaches | |
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| Action required: | Participants are requested to consider this document. | |
| *Keywords:* | *rural and remote telecommunication/ICT access, complementary connectivity, bottom-up telecom infrastructure* | |

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| **Abstract:**  Question 5/1 aims to achieve the mandate and objective of WTDC-17 and plans to do this by identifying best practices and formulating sustainable solutions for challenges faced in access to ICTs by rural and remote communities. In this specific area Resolution 11 and Resolution 19 present a clear need for the analysis and dissemination of best practices and the need for optimum usage of available resources, which can only be achieved if a broader range of models and strategies are considered.  This contribution shows how connectivity models for urban environments cannot simply be transplanted to rural areas - this is the reason many approaches to addressing rural connectivity gaps fail.  There are other, smaller scale connectivity approaches which can complement existing models in policy frameworks aiming to address digital inclusion. Many successful cases are presented, and their strategies cited as key enablers for bridging the digital divide in remote areas of Least Developed Countries (LDCs) in support of accomplishing the Sustainable Development Goals (SDGs). |

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| **Lessons learned and suggested best-practices (if appropriate):**  Complementary connectivity models using bottom-up approaches which involve local communities have real potential to address digital exclusion and incentive economic growth. |

**Introduction**

Rural and remote communities face barriers to telecommunication/ICT infrastructure access, not just because of geographic, demographic, resource or technical constraints in these environments, but more structurally because of the inability of traditional market-based approaches to adequately reach them. Accordingly, there is an opportunity to leverage smaller scale connectivity approaches, as a complement to established commercial models.

These complimentary models presented for consideration in this contribution focus on techniques and sustainable solutions to enable access to telecommunication/ICTs in rural and remote areas. These self-organized smaller scale models have resulted in significantly lower startup and operating costs while strengthening economic and social development. The following sections present a background of the particular issues facing rural and remote communities and examples of alternative connectivity.

The examples provided also demonstrate the progress that has been made towards several Sustainable Development Goals (SDGs), including primarily the development of resilient infrastructure that fosters innovation (SDG9) and the enablement of greater access to education for previously marginalized communities (SDG4).

1. **Background and problem**

Traditional market models are predicated on the assumption that commercial service providers—in collaboration and coordination with government— with the support of universal service funds will provide the investment required to connect universal affordable access to communication. However, this approach tends to privilege infrastructure development in urban areas at the expense of rural and remote communities. There are two major reasons for this dynamic:

1. Due to their relatively low population densities and limited commercial activity, rural and remote communities present low service demand, which renders infrastructural investment in these areas unprofitable for commercial service providers[[1]](#footnote-1).
2. The cost models that would ensure profitability for commercial service providers set unaffordable subscription rates for rural and remote communities, which are generally financially disadvantaged in comparison to urban areas; as such, individuals in these communities would be effectively priced out of using these services, even if sufficient access to infrastructure were available[[2]](#footnote-2).

This is borne out by cases such as Burundi[[3]](#footnote-3) which demonstrate that even when commercial approaches are present many users are left out of the equation; mainly due to lack of coverage or unaffordability. Similarly, India[[4]](#footnote-4) has developed some innovative market approaches to provide connectivity, but despite such efforts in an environment of great market liberalization and faster-growing telecommunications markets there still exists a large, unresolved rural divide.

It is becoming increasingly apparent that traditional market models are not able to fully address the connectivity needs of remote and rural areas. Stakeholders should, therefore, consider moving beyond infrastructure sharing and designating preferential access to available resources for remote communities[[5]](#footnote-5) into adopting strategies for last-mile connectivity solutions through self-organized networks that complement traditional efforts[[6]](#footnote-6).

1. **Complementary connectivity approaches**

Smaller scale network operators that provide complementary connectivity are typically—but not exclusively—not-for-profit, self-organized, and based on support and participation from the community. Importantly, the purpose of complementary network operators is to develop infrastructure and provide low-cost connectivity in areas that are not served by commercial service providers due to both unprofitability and unaffordability[[7]](#footnote-7).

For example, Telecommunciaciones Indigenas Comunitarias A.C, in conjunction with several partners, developed Mexico’s first indigenous telecommunication network to connect 356 rural and remote towns that had not been previously connected by any incumbent operator[[8]](#footnote-8). Not only was this telecommunication network implemented without causing harm or disruption to any other market participants, but this initial investment in infrastructural development also attracted new stakeholders and market entrants to the area. This is a clear example of why innovative policy development is a key enabler for these cases and an urgent need to replicate these models.

1. **Impact of complementary connectivity approaches on economic and social development**

To demonstrate the potential that complementary connectivity approaches present to enabling economic and social development for rural and remote communities, some examples of implementations are presented below.

* 1. **Transformation of economic activity**

In Tusheti, Georgia, the Georgian Telecom Operators Association partnered with the Internet Society (ISOC) Georgia Chapter, the Tusheti Development Fund, the Small and Medium Telecom Operators Association of Georgia (TOA), the Ministry of Economy and Sustainable Development, and the community of Tusheti, to develop a model for providing fixed wireless access to the mountainous region, which had previously been unconnected by broadband and even mobile networks[[9]](#footnote-9).

The self-organized nature of this infrastructural development was key to its sustainability: the community had both the experience and expertise to ensure that equipment selection and architectural considerations were based on the realities of the region’s remote geography and extreme climate. Moreover, the community was strategic in the deployment of this infrastructure, focusing on maximizing the economic impact of Internet connectivity. The access point installation plan focused specifically on connecting hotels, guesthouses, and other businesses that are linked to the tourism industry, which is the main source of the region’s economy. In just two years since this infrastructural development, the Tusheti hospitality sector saw an increase in visitors of over 10%.

* 1. **Optimization of human capital**

In South Africa’s Eastern Cape province, the rural community of Mankosi worked with researchers from the University of the Western Cape to set up a telecommunications cooperative called Zenzeleni Networks Mankosi[[10]](#footnote-10), which provides solar-powered wireless mesh connectivity to its 3,500 residents. As a licensed Internet service provider, Zenzeleni works directly with incumbent regional network operators EastTel and OpenServe to purchase backhaul Internet connectivity from them, reflecting a truly complementary relationship.

Mankosi is plagued by high unemployment rates. This constraint adds up to the high costs of mobile devices and subscriptions: research showed that people in the region spend up to 22% of their income on these costs alone.[[11]](#footnote-11). Since the introduction of the Zenzeleni network, data costs have dropped dramatically, to only a tenth of the market price, and between 20 and 40 times cheaper than previously offered[[12]](#footnote-12). Moreover, the cooperative structure of the Zenzeleni model has ensured that more revenue stays in the Mankosi community. In recent years the revenue was used for microloans to local residents that sought to start small businesses.

The unique, self-organized model of the complementary network in Mankosi has responded directly to the needs of economically vulnerable residents. During the course of 2019, a cooperative following the similar process was set up via the inhabitants from Zithulele, a nearby village[[13]](#footnote-13).

* 1. **Infrastructure development and innovation**

In the rural areas of Catalonia, Spain, the Guifi network has provided complementary connectivity for nearly 20 years, spanning over 67,000 kilometers and more than 30,000 homes[[14]](#footnote-14). In the intervening years, the Guifi.net Foundation has led innovation in the field of telecommunication/ICT infrastructure, both in terms of its technical features and its operations model.

The Guifi network has been deployed on an architectural model that was both inventive and reflective of the needs of the communities that it services. The network has identified creative ways of reducing installation costs—for example, taking advantage of existing water or sanitation infrastructure networks for laying the cable[[15]](#footnote-15).

At the same time, the network has operated on the basis of an innovative public-private partnership that brings together volunteers, investors, customers, and public administrations[[16]](#footnote-16). In 2015, the Guifi network was recognized by the European Commission, which awarded the partnership with a European Broadband Award for its innovative model of financing, business, and investment[[17]](#footnote-17).

**Conclusion and recommendation**

To bridge the urban/rural digital divide in efforts to truly enable economic and social development overall, Member States and Sector Members must consider approaches to telecommunication/ICT infrastructure development and service provision that complement traditional market models. Particularly, participants of ITU-D SG1 are invited to consider:

* How well the needs of rural and remote areas are being addressed by traditional market models for telecommunication/ICT infrastructure and service provision.
* Current smaller scale connectivity models that are self-organized and community-driven, and how they benefit the economic and social development of rural and remote communities.
* How public-private partnerships and other collaborations between communities and local government can help self-organized networks thrive as complements and partners to commercial service providers.
* The urgent need of policy models that enable, community-driven, smaller scale connectivity approaches in a legal and formal manner providing them with the necessary resources to support their constituency.

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