POLICY BRIEF

Meaningful Access and Local Economic Development: The Dual Impact of Enabling Community-Centred Connectivity

2025

Dr Carlos Rey-Moreno, Co-manager Local Networks Programme, Association for Progressive Communications (South Africa)
Ms Josephine Miliza, LocNet Policy and Regulation Lead, Association for Progressive Communications (South Africa)

02

Digital Transformation

Abstract

Despite the internet's critical role in education, employment, and economic growth, traditional commercial models fail to deliver affordable, high-speed connectivity to rural and underserved communities. While Universal Service Funds and large-scale investments have expanded access, profit-driven approaches struggle in low-revenue areas, leaving millions behind. Hence, a persistent digital divide continues to exclude nearly a third of the global population from meaningful internet access.

Solutions that prioritise decentralised, community-centred networks that integrate local ownership, sustainable business models, and participatory governance are emerging and achieving positive results. These initiatives – often led by micro, small, and medium-sized enterprises (MSMEs), but also by communities, social enterprises, cooperatives, and local governments – demonstrate cost-effective scalability by leveraging existing community engagement and reducing operational overheads. As key drivers of local economies, these community-led networks not only provide connectivity but also catalyse broader economic growth by supporting other small businesses through digital tools and skills development. Beyond connectivity, they foster digital literacy, local content creation, and economic empowerment, aligning with the broader Sustainable Development Goals.

Policy recognition is growing, with the International Telecommunication Union, OECD, and G20 endorsing community networks as complementary solutions. However, systemic barriers – such as inappropriate licencing frameworks, spectrum scarcity, and financing gaps – hinder their expansion. Case studies from Brazil, Colombia, Indonesia, Kenya, the Philippines, and South Africa highlight six key enablers: (1) diversifying telecom ecosystems to include social MSME providers, (2) reducing regulatory burdens, (3) unlocking public and blended financing, (4) enabling spectrum access, (5) ensuring affordable backhaul infrastructure, and (6) raising awareness and building capacity through targeted training programmes.

To bridge the digital divide, governments must transition from recognition to action – implementing tailored policies that empower community-centred connectivity initiatives. These efforts can amplify the impact of grassroots connectivity initiatives, ensuring equitable access for all.

Keywords: Digital Divide, Meaningful Connectivity; Community-Centred Connectivity; Universal Service Funds (USF); Decentralised Connectivity; Spectrum Sharing; Sustainable Development Goals (SDGs); Regulatory Enablers, Social Impact Investment; Capacity Building; SMMEs (Small, Medium and Micro Enterprises); Complementary Connectivity Solutions.

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Diagnosis

According to the International Telecommunications Union (ITU), nearly a third of humanity has never used the internet.[1] In low-income countries, only 16% of people living in rural areas and 33% of those in urban areas use the internet.[2] Additionally, there are significant gender imbalances. It is estimated that 70% of men are connected to the internet, while only 65% of women are.[3] Despite these disparities, A4AI's 2020 Affordability Report found that over 40% of assessed countries lacked strong policies or initiatives to improve affordable internet access for women.[4]

In an increasingly globalised digital economy, where the internet has become a gateway to education, communication, jobs, commerce, government services, improved livelihoods, and life opportunities, the gap between those benefitting from meaningful connectivity and those who do not is rapidly widening, exacerbating social and economic inequality. This includes exclusion from digital public infrastructures being developed worldwide.

While traditional models have proven fundamental to providing the connectivity the world experiences today, they have failed to offer meaningful connectivity to those with lower incomes in rural, remote, and underserved areas.[5] Even where sufficient users exist to justify infrastructure investment, statistics from GSMA, the association representing mobile operators globally, show that in rural areas,

[1] International Telecommunication Union. *ICT Indicators for the Monitoring of the Digital Divide (2024)*. Geneva: ITU, 2024. https://www.itu.int/dms_pub/itu-d/opb/ind/d-ind-ict_mdd-2024-4-pdf-e.pdf.

[2] Ibid.

[3] Ibid.

[4] The Alliance for Affordable Internet. Universal Service and Access Funds: An Untapped Resource to Close the Gender Digital Divide (2018). https://a4ai.org/research/report/universal-service-and-access-funds-an-untapped-resource-to-close-the-gender-digital-divide

[5] International Telecommunication Union. "New UN Targets Chart Path to Universal Meaningful Connectivity." *ITU Hub*, April 19, 2022. https://www.itu.int/hub/2022/04/new-un-targets-chart-path-to-universal-meaningful-connectivity/.

traditional operators can only provide traffic-capped mobile data services, which remain unaffordable for the general population.[6]

Hence, even with public funds channelled through Universal Service Funds (USF) to improve operators' return on investment, a business case for these operators to offer affordable, uncapped high-speed services in areas with low average revenue per user (ARPU) remains absent. As the recent ITU Digital Infrastructure Investment Initiative report (launched in coordination with Brazil's G20 presidency) indicates, "for individuals in these locations to benefit from meaningful connectivity, stakeholders should think beyond the typical profit-seeking business plan".[7]

In recent years, demand-side approaches to connectivity have emerged, prioritising social returns by focusing on the communication needs of underserved users. Decentralised, local, community-centred connectivity initiatives – where users are part of the solution – have proven successful and sustainable alternatives to national commercial networks.[8] These solutions offer unique advantages: they begin at a small scale, incorporate diverse ownership and operating models to ensure financial sustainability, and avoid costly marketing since community members know the network.

These initiatives range from networks fully deployed and operated by community organisations to those set up by social enterprises, cooperatives, and local governments, where community members participate at different stages of the

[6] Shanahan, M., and K. Bahia. *The State of Mobile Internet Connectivity 2023*. GSMA, 2023. https://www.gsma.com/r/somic/?ID=a6g1r000000xnptAAA&JobID=1709262 .

[7] International Telecommunication Union. *Digital Infrastructure Investment Initiative*. Geneva: International Telecommunication Union, 2025. https://www.itu.int/hub/publication/s-dii-diii-whitepaper-2025/.

[8] Rey-Moreno, Carlos. *Typology of Community-Centred Connectivity Initiatives*. Edited by Alan Finlay. Johannesburg: Association for Progressive Communications, 2024. https://www.apc.org/sites/default/files/typology-of-community-centred-connectivity-initiatives.pdf.

telecommunications infrastructure value chain.[9] This participation contributes to cost-effectiveness in delivering affordable meaningful connectivity.[10]

These initiatives are part of the ecosystem of micro, small, and medium-sized enterprises (SMMEs), which are the lifeblood of many economies – especially in the developing world – yet have received insufficient support in a sector typically dominated by a handful of national carriers. As SMMEs, these smaller networks also play a catalytic role in local economic ecosystems by enabling other SMMEs through access to connectivity and skills development that improves their access to information, market reach, efficiency tools, and e-government services.

Community-centred connectivity operators take a holistic and inclusive approach to meaningful connectivity, combining local skills development, culturally relevant content, and support for women's inclusion in technical and operational roles. The social inclusion and transformational impact of these services significantly increase social returns on investment, multiplying the benefits of every dollar spent.[11] In this way, these initiatives contribute to multiple Sustainable Development Goals (SDGs) beyond connectivity alone.

[9] Rey-Moreno, Carlos; Greene, Laina Raveendran and Jensen, Mike. "Innovative Financing Mechanisms to Bridge the Digital Divide." In *Global Information Society Watch 2024 Special Edition: WSIS+20: Reimagining Horizons of Dignity, Equity and Justice for Our Digital Future*, 52–62. Johannesburg: Association for Progressive Communications, 2024. https://www.giswatch.org/sites/default/files/GS2024-carlos-greene-jensen.pdf

[10] International Telecommunication Union. *Universal Service Financing Efficiency Toolkit: A Practical Guide for Impactful and Sustainable Universal Access and Service Implementation*. Geneva: International Telecommunication Union, 2022. https://www.itu.int/itu-d/reports/regulatory-market/usf-financial-efficiency-toolkit/.

[11] Dacanay, Marie Lisa; Teo, Albert; and Lacsamana, Jay. *Towards Measuring the Social Impact and Cost Effectiveness of CCCIs.* 2025. Association for Progressive Communications. https://www.apc.org/en/pubs/case-studies-and-integrative-report

Recommendations

Recognition of these initiatives has grown, reflected in T20 policy recommendations by the Indonesian[12] and Brazilian[13] G20 presidencies, the OECD Council's Recommendation on Broadband Connectivity,[14] and ITU resolutions at the World Telecommunications Development Conference[15] and the Plenipotentiary Conference.[16] However, greater recognition is only the first step; deliberate action at the national level is needed to enable and scale these community-driven solutions.

Since 2017, the APC-Rhizomatica LocNet initiative[17] has worked with community-centred connectivity providers, policymakers, and regulators to develop enabling frameworks. Key elements have emerged to ensure an enabling financial and regulatory environment.

- **Deepen insight into the value of a diversified ecosystem**. Acknowledging the failure of traditional operator models to close digital gaps and exploring complementary efforts with business models more tailored to underserved areas, is critical. For example, the Communications Authority

[12] Think20 Indonesia. *T20 Communiqué Indonesia*. Jakarta: Think20 Indonesia, 2022. https://t20southafrica.org/wp-content/uploads/2024/12/T20-Communique-Indonesia.pdf.

[13] CEBRI, IPEA, and FUNAG. *T20 Brasil: Communiqué and Implementation Roadmaps*. Rio de Janeiro: CEBRI, 2024. https://t20southafrica.org/wp-content/uploads/2024/12/T20_Communique_Brasil.pdf

[14] Organisation for Economic Co-operation and Development (OECD). *Recommendation of the Council on Broadband Connectivity*. OECD, June 10, 2021. https://legalinstruments.oecd.org/en/instruments/OECD-LEGAL-0322.

[15] Resolution 37: Bridging the digital divide, International Telecommunication Union. *World Telecommunication Development Conference (WTDC-22): Final Report*. Geneva: ITU, 2022. https://www.itu.int/dms_pub/itu-d/opb/tdc/D-TDC-WTDC-2022-PDF-E.pdf.

[16] Resolution 139: Use of telecommunications/information and communication technologies to

bridge the digital divide and build an inclusive information society, International Telecommunication Union. *Final Acts of the Plenipotentiary Conference (Bucharest, 2022)*. Geneva: ITU, 2022. http://handle.itu.int/11.1002/pub/81da0d1c-en

[17] Association for Progressive Communications. *Digital Inclusion*. Accessed April 2, 2025. https://www.apc.org/en/our-work/themes/digital-inclusion.

in Kenya[18] and Anatel in Brazil[19] commissioned work to explore enablers for community-centred connectivity initiatives. Similarly, the Data Services Market Inquiry from the Competition Commission in South Africa recommended incentivising diversity via community networks.[20] Anatel has gone one step further by creating in 2023 a Working Group which supports continued dialogue with these initiatives to operationalise enablers for them.[21]

- **Reduce regulatory requirements for these providers**. Hefty licence fees and compliance requirements for small network operators exist in most countries from the Global South. This contrasts with regulatory frameworks in developed markets, which are characterised by a simple authorisation or registration system permitting internet service provision without a licence. Lowering licence fees, or waving them, and reducing administrative burdens, are among the most important incentives.[22] In Kenya, most of those incentives exist via a new Community Network and Service Licence[23]. In South Africa, initiatives have used licence-exempt

18 Communications Authority of Kenya, *Licensing and Shared Spectrum Framework for Community Networks*, May 2021, https://repository.ca.go.ke/bitstream/handle/123456789/47/Licensing-and-Shared-Spectrum-Framework-for-Community-Networks-May-2021.pdf?sequence=1

19 Labardini Inzunza, Adriana. *Policy Brief and Recommendations for an Enabling Environment for Community Networks in Brazil*. Association for Progressive Communications. November 2021. https://sei.anatel.gov.br/sei/modulos/pesquisa/md_pesq_documento_consulta_externa.php?eEP-wqk1skrd8hSlk5Z3rN4EVg9uLJqrLYJw_9INcO7Pwj-3IV1l7IHgYMB-bbrYeBUxe1cWNVSkPuk8jN_6nkpj_OiAnYbrUD2KqGMhro4XY785bcVkb50mNt5TGB4F

20 Competition Commission of South Africa. *Data Market Inquiry: Summary*. 2019. http://www.compcom.co.za/wp-content/uploads/2019/12/Data-Market-Inquiry-SUMMARY.pdf.

21 Agência Nacional de Telecomunicações (Anatel). "GT RCom." Accessed April 4, 2025. https://www.gov.br/anatel/pt-br/composicao/grupos-de-trabalho/gt-rcom.

22 International Telecommunication Union (ITU). *Global Symposium for Regulators 2021 Best Practice Guidelines*. 2021. https://www.itu.int/en/ITU-D/Conferences/GSR/2021/Documents/GSR-21_Best-Practice-Guidelines_FINAL_E_V2.pdf

23 Communications Authority of Kenya. *Community Network and Service Provider Licence*. Accessed April 4, 2025. https://www.ca.go.ke/sites/default/files/CA/Licenses%20Templatses/Community%20Network%20and%20Service%20Provider%20Licence.pdf.

regulations while a more robust framework is designed.[24] This is the case in the Philippines too,[25] and in Brazil an authorisation under the Service of Restricted Interest category[26] is available. The Colombian government has issued a decree with a special regime for these initiatives with a five-year exemption of official fees.[27]

- **Establish innovative financing and investment models** for community-centred operators to catalyse their impact. The Global Digital Compact includes commitments to invest in "local networks" to close digital divides.[28] One option would be through USF, which should be strategically designed and implemented to address key barriers to meaningful connectivity, including gender and socio-economic gaps. The UN Broadband Commission has already recommended community networks to be funded by USF.[29] Argentina was a pioneer in this approach,[30] Brazil[31] and Kenya[32] have recently authorised it, and in Indonesia connectivity initiatives are

24 Government of South Africa. *Next-Generation Radio Frequency Spectrum for Economic Development*. 2024. South African Government Gazette No. 50725 on May 28, 2024

25 Senate of the Philippines, "Cayetano-sponsored bill for nationwide internet access gets Senate nod," press release, February 6, 2025, https://legacy.senate.gov.ph/press_release/2025/0206_cayetanoa2.asp.

26 Agência Nacional de Telecomunicações (Anatel). *Redes Comunitárias: Universalização das Redes de Telecomunicações*. n.d. https://www.gov.br/anatel/pt-br/regulado/universalizacao/redes-comunitarias.

27 Ministerio de Tecnologías de la Información y las Comunicaciones (Ministerio TIC), "Publicación Decreto Internet Comunitario Fijo," accessed April 4, 2025, https://www.mintic.gov.co/portal/inicio/Sala-de-prensa/Noticias/276726:Publicacion-decreto-internet-comunitario-fijo.

28United Nations. *Global Digital Compact*. United Nations, 2023. https://www.un.org/digital-emerging-technologies/global-digital-compact.

29United Nations Broadband Commission for Sustainable Development. *21st Century Financing Models: Broadband Commission*. 2021. https://broadbandcommission.org/wp-content/uploads/dlm_uploads/2021/11/21st-Century-Financing-Models-Broadband-Commission.pdf.

30ENACOM (Ente Nacional de Comunicaciones). *Convocatoria Para La Adjudicación De Aportes No Reembolsables Para El Desarrollo De Infraestructura De Internet A Través De Redes Comunitarias Programa "Roberto Arias"*. May 23, 2023. https://www.enacom.gob.ar/multimedia/noticias/archivos/202305/archivo_20230523045957_7544.pdf.

31Teletime. "GT da Anatel quer redes comunitárias entre projetos financiáveis pelo Fust." March 26, 2025. https://teletime.com.br/26/03/2025/gt-da-anatel-quer-redes-comunitarias-entre-projetos-financiaveis-pelo-fust/.

32Communications Authority of Kenya. Universal Service Fund Strategy 2023–2027. Nairobi: Communications Authority of Kenya, 2023. https://www.ca.go.ke/sites/default/files/CA/USF%20Strategy/Universal%20Service%20Fund%20Strategy%202023-2027.pdf

supported by village funds from the Ministry of Villages.[33] In Colombia, the European Commission's Global Gateway is funding community-centred connectivity in demilitarised zones under the peace process.[34] Additionally, community-centred initiatives are also using other financing mechanisms such as demand aggregation, blended finance, concessional loans, credit guarantees, and development/social impact bonds.[35] However, these efforts require private and public financiers to adapt financial products for these initiatives that are very different from the large infrastructure investment projects they traditionally fund.

- **Adopt innovative mechanisms to allow community-centred connectivity providers access to radio frequency spectrum** that is either unused or unassigned in underserved areas. Mobile spectrum sharing has become widespread in the global North,[36] but adoption in the global South, where it is most needed,[37] is still the exception. While in Mexico a social purpose mobile spectrum licence was pioneered,[38] in Colombia experiments have been authorised and monitored by the relevant authorities to enable this

[33] Kementerian Desa, Pembangunan Daerah Tertinggal, dan Transmigrasi Republik Indonesia (Kemendes PDTT). 2020. *Peraturan Menteri Desa, Pembangunan Daerah Tertinggal, dan Transmigrasi Nomor 13 Tahun 2020 tentang Prioritas Penggunaan Dana Desa Tahun 2021*.

[34] Ministerio de Tecnologías de la Información y las Comunicaciones (MinTIC). "Conectando a los no conectados", proyecto del Ministerio TIC con la Unión Europea y Colnodo para la reducción de la brecha digital en zonas rurales de Colombia. Last modified May 9, 2025. https://www.mintic.gov.co/portal/inicio/Sala-de-prensa/Noticias/401110:Conectando-a-los-no-conectados-proyecto-del-Ministerio-TIC-con-la-Union-Europea-y-Colnodo-para-la-reduccion-de-la-brecha-digital-en-zonas-rurales-de-Colombia.

[35] Connectivity Capital. *Financing Mechanisms for Locally Owned Internet Infrastructure*. Association for Progressive Communications, 2021. https://www.apc.org/sites/default/files/financing-mechanisms-for-locally-owned-internet-infrastructure.pdf.

[36] Innovation, Science and Economic Development Canada (ISED). *Decision on Non-Competitive Local Licensing Framework, Including Spectrum in the 3900–3980 MHz Band*. Accessed April 4, 2025. https://ised-isde.canada.ca/site/spectrum-management-telecommunications/en/spectrum-allocation/decision-non-competitive-local-licensing-framework-including-spectrum-3900-3980-mhz-band-and.

[37] United Nations Broadband Commission for Sustainable Development. *21st Century Financing Models: Broadband Commission*. 2021. https://broadbandcommission.org/wp-content/uploads/dlm_uploads/2021/11/21st-Century-Financing-Models-Broadband-Commission.pdf

[38] Song, Stephen; Rey-Moreno, Carlos; and Jensen Michael, *Innovations in Spectrum Management*, 2019, https://www.internetsociety.org/resources/doc/2019/innovations-in-spectrum-management/.

Possibility.[39] In Brazil, an authorisation for mobile spectrum on a secondary basis has recently been created.[40] South Africa has also enacted policy to give community-centred connectivity initiatives access to unused mobile spectrum.[41]

- **Ensure affordable access to backhaul networks.** Securing sufficient backhaul capacity is often the single largest cost element for small networks, especially where affordable access to national backbones and middle-mile fibre networks is limited or not competitively priced for small-scale operators. Examples of this enabler are scarce, with the notable exception of the Palapa Ring in Indonesia.[42]
- **Raise awareness and build capacity.** These are required to develop the pipeline of socially-driven initiatives that could effectively use the aforementioned incentives to close the digital divide. Examples to raise awareness exist in Brazil, with a website on community networks maintained by the regulator,[43] and similarly in Colombia.[44] The LocNet Initiative[45] and the Internet Society[46] maintain similar resources and facilitate capacity

39Agencia Nacional del Espectro (ANE), *Documento de Análisis del Árbol de Problemas para la Maximización del Uso del Espectro Radioeléctrico* (Bogotá: ANE, July 2022), accessed April 7, 2025, https://www.ane.gov.co/Sliders/archivos/gesti%C3%B3n%20t%C3%A9cnica/Estudios%20de%20gesti%C3%B3n%20y%20planeaci%C3%B3n/Maximizar%20el%20uso%20de%20espectro/Documentos%20para%20consulta/DocumentoArbolProblemaMaximizacion.pdf.

40Agência Nacional de Telecomunicações (ANATEL). *Ato nº 17.985, de 5 de julho de 2024*. 2024. Accessed April 7, 2025. https://informacoes.anatel.gov.br/legislacao/atos-de-requisitos-tecnicos-de-gestao-do-espectro/2024/1999-ato-17985.

41Government of South Africa. *Next-Generation Radio Frequency Spectrum for Economic Development*. 2024. South African Government Gazette No. 50725 on May 28, 2024

42*Palapa Ring Barat*, accessed April 7, 2024, https://prb.net.id/.

43Agência Nacional de Telecomunicações (Anatel). *Redes Comunitárias: Universalização das Redes de Telecomunicações*. n.d. https://www.gov.br/anatel/pt-br/regulado/universalizacao/redes-comunitarias.

44Colnodo. "Redes Comunitarias en Colombia." Accessed April 4, 2025. https://www.redescomunitarias.co/.

45Association for Progressive Communications (APC). "Community Networks Learning." Accessed April 4, 2025. https://cnlearning.apc.org/.

46Internet Society. "Community Network DIY Toolkit." Accessed April 4, 2025. https://www.internetsociety.org/resources/community-network-diy-toolkit/.

building. Courses available in the ITU Academy are also critical.[47]

In countries where recognition of community-centred connectivity initiatives is translating into tangible enablers, initiatives are expanding. In Kenya, more than 15 initiatives have emerged in just two years.[48] In Brazil, 63 were identified in research in 2022,[49] before the creation of Anatel's working group.[50] In Colombia, 15 have been identified,[51] 23 in Indonesia, and 93 in the Philippines.[52]

Community-centred connectivity initiatives are proving effective in delivering meaningful access where commercial models fall short. To unlock their full potential, the G20 is uniquely positioned to catalyse national-level action and global alignment across the enabling elements described above, in collaboration with non-G20 countries and multilateral bodies. Practical steps the G20 could take include:

- Leading efforts to normalise recognition of community-centred connectivity as a strategic response to digital exclusion -especially in rural areas - by making it a standing item in the Digital Economy Working Group.
- Engaging development banks, donor agencies, and G20 development finance institutions to create innovative funding instruments, including

[47] International Telecommunication Union. "Digital Inclusion of Indigenous Peoples." Accessed April 7, 2025. https://www.itu.int/en/ITU-D/Digital-Inclusion/Indigenous-Peoples/Pages/default.aspx.

[48] Internet Governance Forum. *Plenary Report from the Policy Network on Meaningful Access*

Plenary Report. 2024. https://intgovforum.org/en/filedepot_download/256/28586.

[49] NIC.br, *Estudos Setoriais: Redes Comunitárias de Internet no Brasil*, September 5, 2022, https://www.nic.br/media/docs/publicacoes/7/20220905125048/estudos_setoriais_redes_comunitarias_de_internet_no_brasil.pdf.

[50] This Working Group has increased the public awareness and national support for these initiatives and reduced existing prejudice as they were previously defined as 'illegal networks'.

[51] Colnodo. "Redes Comunitarias en Colombia." Accessed April 4, 2025.

https://www.redescomunitarias.co/es/redes-comunitarias-en-colombia.

[52] Toquero, Armen Ria, Gomer Padong, Cindy Falcutila, and Carlos Rey-Moreno. *Understanding Community-Centered Connectivity Initiatives in Asia and the Pacific*. April 2025. Association for Progressive Communications. https://www.apc.org/en/pubs/understanding-community-centred-connectivity-initiatives-asia-and-pacific.

earmarking USFs for community-led projects.

- Formalising mechanisms for peer learning, technical cooperation, and showcasing best practices. This includes funding regulatory capacity-building and integrating community connectivity into G20 digital skills and education initiatives.

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