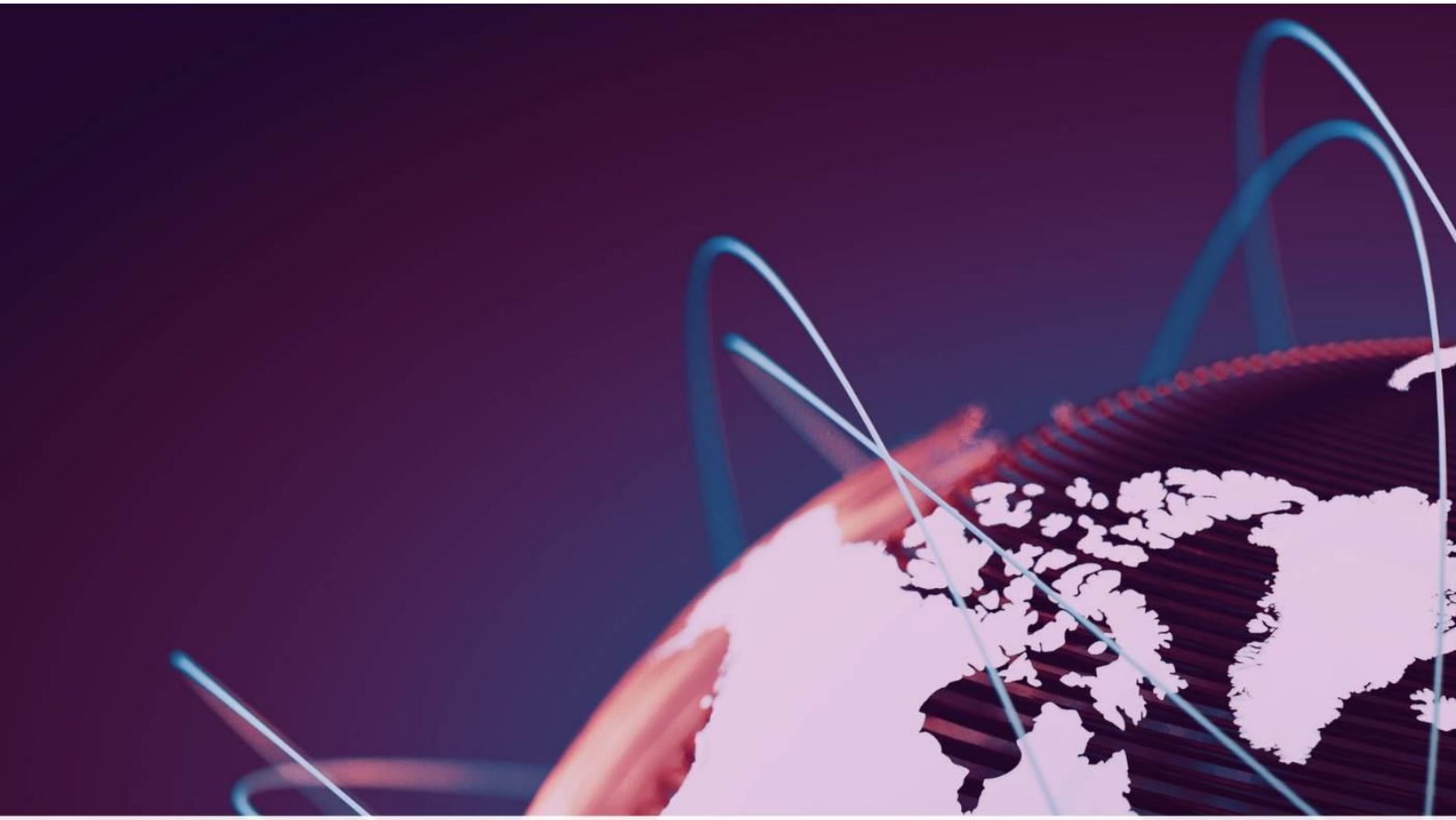
IGF Internet Governance Forum



POLICY NETWORK ON MEANINGFUL ACCESS

From Knowledge to Implementation: The PNMA's Contribution to WSIS+20 and GDC

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POLICY NETWORK
ON MEANINGFUL ACCESS

United Nations Internet Governance Forum (IGF) Secretariat

Policy Network on Meaningful Access

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INTERNET GOVERNANCE FORUM

The Internet Governance Forum (IGF) is a global multistakeholder platform that facilitates the discussion of public policy issues pertaining to Internet governance. The IGF was one of the most important outcomes of the United Nations World Summit on the Information Society (WSIS). The Tunis Agenda, adopted on 18 November 2005, mandated the UN Secretary-General to convene a new forum for multistakeholder policy dialogue. The convening of the IGF was announced by the Secretary-General on 18 July 2006, with the inaugural meeting of the Forum held from 30 October to 2 November 2006.

The existing mandate of the IGF, as set out in paragraphs 72 to 78 of the Tunis Agenda, was extended for a further ten years in a resolution adopted by the UN General Assembly on 16 December 2015 (70/125), which served as the outcome document of the high-level meeting of the General Assembly on the overall review of the implementation of the outcomes of the World Summit on the Information Society.

In between the two annual meetings, the intersessional work of the IGF is conducted in a community-centred, open, inclusive, cooperative, and collaborative, bottom-up manner. The intersessional work takes different forms, such as Best Practice Forums, Policy Networks, Dynamic Coalitions, capacity development activities, and close cooperation with the national, regional, and youth IGF initiatives, which continue throughout the year.

Institutionally, the IGF is supported by the IGF Secretariat, which is administered by the UN Department of Economic and Social Affairs (UN DESA). The programme of the annual IGF meeting is developed by its Multistakeholder Advisory Group (MAG), whose members are appointed by the UN Secretary-General. An IGF Leadership Panel, with members also appointed by the Secretary-General, has supported IGF strategic improvements since 2022.

So far, twenty annual meetings of the IGF have been held, nineteen hosted by governments and one conducted fully online due to the COVID-19 pandemic.

LIST OF ACRONYMS

ABC	Accessible Books Consortium
AEs	Authorised Entities
AfLIA	African Library & Information Associations & Institutions
AI	Artificial Intelligence
AI4IA	Artificial Intelligence for Information Accessibility
APC	Association for Progressive Communications
AU	African Union
AV	Audio-Video
BOLT	Building Opportunities/Leveraging Technologies
BPF	Best Practice Forum
CAPEX	Capital Expenditure
CARE	Collective Benefit, Authority to Control, Responsibility, Ethics
CCCIs	Community-Centred Connectivity Initiatives
CDIP	Committee on Development and Intellectual Property
CENIA	Centro Nacional de Inteligencia Artificial / Chilean National Center for Artificial Intelligence
CETIC	Centro de Tecnologias de Informação e Comunicação
CN	Community Networks
DC	Dynamic Coalition
DCAD	Dynamic Coalition on Accessibility and Disability
DNA	Digital National Archive
DPIDG	Division for Public Institutions and Digital Government
DTN	Delay Tolerant Networks
EAA	Estudios Aplicados Antropología
EBU	European Broadcasting Union (member of WBU)
EC	European Commission
EGDI	E-Government Development Index
ENSIAS	École Nationale Supérieure d'Informatique et d'Analyse des Systèmes
EU	European Union
FAIR	Findable, Accessible, Interoperable, Reusable
FCDO	Foreign, Commonwealth and Development Office
FGV	Fundação Getúlio Vargas
G20	Group of Twenty
GDC	Global Digital Compact
GDIP	Global Digital Inclusion Partnership
GPS	Global Positioning System
HCI	Human Capital Index
HF	High Frequency
ICANN	Internet Corporation for Assigned Names and Numbers
ICT	Information and Communication Technology
ICT4D	Information and Communication Technology for Development
ICTP	International Centre for Theoretical Physics
IDUAI	International Day for Universal Access to Information
IEEE	Institute of Electrical and Electronics Engineers

IFAP	Information for All Programme
IFLA	International Federation of Library Associations
IGF	Internet Governance Forum
IGO	International/Intergovernmental Organisation
IoT	Internet of Things
IP	Internet Protocol
IPNSIG	Interplanetary Networking Special Interest Group
ISOC	Internet Society
ITU	International Telecommunication Union
IUI	Internet Universality Indicators
LDCs	Least Developed Countries
LEO	Low Earth Orbit
LLDCs	Landlocked Developing Countries
LocNet	Local Networks
LP	Leadership Panel
LT4ALL	Language Technology for All
LTU	Luleå Technical University
MWG	Multistakeholder Working Group
NGO	Non-Governmental Organisation
NRI	National and Regional Initiatives
OA	Open Access
OAS	Organization of American States
ODL	Open and Distance Learning
OER	Open Educational Resources
OLI	Offline Internet Consortium
OSI	Online Service Index
PNG	Papua New Guinea
PNMA	Policy Network on Meaningful Access
SDG	Sustainable Development Goals
SIDA	Swedish International Development Cooperation Agency
SIDS	Small Island Developing States
SMS	Short Message Service
SROI	Social Return on Investment
TDM	Text and Data Mining
TII	Telecommunication Infrastructure Index
UMC	Universal and Meaningful Connectivity
UN	United Nations
UN DESA	United Nations Department of Economic and Social Affairs
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNGA	United Nations General Assembly
UNHCR	United Nations High Commissioner for Refugees
UNU-MERIT	United Nations University - Maastricht Economic and Social Research and Training Centre on Innovation and Technology
UPU	Universal Postal Union
USF	Universal Service Fund
UVP	Unique Value Proposition
WBU	World Broadcasting Unions

WIPO	World Intellectual Property Organization
WSIS	World Summit on the Information Society
WTDC	World Telecommunication Development Conference

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EXECUTIVE SUMMARY

Once more the lesson learned through the last year of activities related to the PNMA is the same: the whole humanity could be connected because technically speaking this is now possible; connectivity without local contents, local services, in local languages will not work, but there is something in the current approaches that prevent to achieve the goal to reach the remaining 2,6 billion people unconnected[1].

Some misleading statistics have recently circulated even in official documents, mentioning that "*The proportion of the world's population living in areas covered by broadband networks capable of providing effective Internet access is now over 95 per cent, with more than 90 per cent now covered by 4G networks. The proportion of people aged ten or over owning a mobile phone worldwide has reached almost 80 per cent, while the proportion of people now making use of the Internet has risen from just over 15 per cent in 2005 to more than 67 per cent in 2025*." In reality these numbers also include the coverage provided by satellite networks and by all kinds of mobile signals. It is like saying that all human beings have access to water because it rains at least once a year everywhere - these numbers have to be read in a different way. If the Internet signal is so widely available, the reason why more than one third of the world population still has no access to it is that the current modus of connectivity offered is not adapted to the conditions of said part of the population.

In fact, the coverage via LEO satellites remains very expensive and unaffordable without a certain number of conditions (e.g., continuous and stable access to electricity, technological skills and equipment availability). Additionally, access via mobile internet remains prohibitive to the poorer, for the cost of the devices and of the subscription fees.

As emerged clearly once more through the debate at the PNMA plenary session in Lillestrøm, the problem of the cost remains nowadays the main obstacle to meaningful access, whatever new technology may be invented. This is a typical case of market failure that needs to be tackled with a change of socioeconomic paradigm. The proportion of the unconnected over the world population tends to remain quite stable over the years, so probably it is time to change perspectives and to explore new forms of connectivity that are free or paid by the community - something equivalent to today's "Free to Air" distribution system that allows billions of people to receive radio and tv signals, at the only affordable-to-all condition to have a receiver. The renewed attention for the community networks and the idea to create the right financial conditions to multiply these experiences championed by the G20 (see the new *South African new national strategy* for more) is an interesting step in this direction and an example to follow.

Moreover, there are other similar experiments that seem promising and need to be developed and replicated on large scale, such as the 5G broadcasting experiments (explored in the EBU's section) or the Delay Tolerant Networks (DTN), developed originally for interplanetary communications and currently finding their way into projects in remote areas of the Earth (as demonstrated in the ICTP's section).

At most, it is clear that new forms of collective and nearly-free Internet access need to be identified and put in practice in order to reach the most vulnerable, that third of the world population that is currently excluded from an online existence.

[1] International Telecommunication Union – ITU. *Connecting humanity action blueprint: Advancing sustainable, affordable and innovative solutions*, September 2025.

1. INTRODUCTION

The concept of **meaningful access** has emerged in response to the growing body of evidence that even when people have connectivity, they might not be fully benefiting from the Internet. How one gets connected to the Internet is an equally important challenge to the experience that person will have once they are online, even more so to the community/country in which they live. While access to infrastructure is critical, it must also be inclusive, accessible, useful, sustainable, and affordable, linked to human capacity development and relevant content - otherwise, it will not achieve its potential. Many of the efforts on access, unfortunately, are only focusing on bringing connections to final users (the consumers), without taking into consideration the potential of the Internet to enhance inclusivity and accessibility for all and also as a way to create, communicate, and produce content and services locally and in local languages (turning consumers into citizens).

1.1 The IGF

The Internet Governance Forum (IGF) is a global arena, convened by the United Nations Secretary-General[2], where governments, civil society, the Internet technical community, academia, the private sector, and independent experts exchange information and share best practices around Internet governance and policy issues[3]. It brings together different stakeholder groups as equals, working as a facilitator of a common understanding of the Internet's opportunities and threats.

In 2025, the twentieth annual meeting of the IGF was hosted by the Kingdom of Norway between 23rd and 27th June. The hybrid event explored the overarching theme "Building Digital Governance Together," and the PNMA activities can be found under the subtheme "[Building] Universal Access and Digital Rights."

1.2 The PNMA

The Policy Network on Meaningful Access (PNMA) is an intersessional activity within the IGF, created to establish an expert-led framework network on broad Internet governance topics, making room for in-depth multistakeholder efforts. It aims to identify best practices and successful solutions applied somewhere in order to formulate impact-driven, concrete, and actionable policy recommendations on how to achieve meaningful and universal Internet access aligned with the Secretary-General's Roadmap for Digital Cooperation and the Sustainable Development Goals. The PNMA foundations are grounded on:

[2] The *resolution adopted by the UN General Assembly on 16 December 2015 (70/125)*, "Outcome document of the high-level meeting of the General Assembly on the overall review of the implementation of the outcomes of the World Summit on the Information Society", extended the mandate of the IGF as set out in paragraphs 72 to 78 of the Tunis Agenda.

[3] IGF website: *http://www.intgovforum.org*. The IGF is one of the key outcomes of the World Summit on the Information Society (WSIS).

- the IGF mandate at paragraph 72 of Tunis Agenda, for the exchange of information and engagement of stakeholders - in particular from developing countries - as well as capacity development in Internet governance;
- paragraph 93(e) from the United Nations Secretary-General's Roadmap for Digital Cooperation as it envisages a strengthened IGF with a view to making it more responsive and relevant to digital issues, and streamline priority areas (global connectivity, digital inclusion, capacity building);
- Our Common Agenda First Commitment ("Leave no one behind") and Seventh Commitment ("Improve digital cooperation");
- the Global Digital Compact future engagements.

Since the start of its activities in 2021, the Policy Network has delivered recognisable outcomes from the incremental yearly work to build knowledge and bridge communities to exchange practice in the PN's overarching thematic streams:

- **Connectivity** (Infrastructure & Business Models)
- **Digital Inclusion** through a citizen-centric approach (accessibility & multilingualism: local services and contents in local languages based on local needs and resources)
- **Capacity Development** (technical skills training).

Notably, one of its main outcomes **is the analysis of stakeholders' experiences with the implementation and problem-solving of the issues contemplated by its focus areas**. By building a *PNMA Repository of Good Practices*, the network was able to assess reasons as to why practices have or have not expanded, why digital divides persist, and which structural issues repeat themselves in different scenarios. This knowledge has also been reflected in an endorsed list of *Literature on Meaningful Access*, available for updates throughout the year.

The success of the Policy Network is granted by its network of peers - its Multistakeholder Working Group (MWG) - and bridged discussions within and beyond the IGF community. Intersessional work and ways of collaboration and advocacy with other IGF areas (e.g., Dynamic Coalitions and National and Regional Initiatives) and the Leadership Panel have been strengthened; cooperation has been renewed with IGOs such as the Internet Corporation for Assigned Names and Numbers (ICANN), the International Federal of Library Associations (IFLA), the International Telecommunications Union (ITU), the United Nations Educational, Scientific and Cultural Organization (UNESCO), United Nations Department of Economic and Social Affairs (UNDESA), United Nations High Commissioner for Refugees (UNHCR), Internet Society (ISOC), and the World Intellectual Property Organization (WIPO).

1.3 2025 Objectives

For the past two years, the continuous multistakeholder public debate on meaningful access has considered the Global Digital Compact, the deliberations from NETMundial+10, and the WSIS+20 and IGF+20 processes. In parallel to positioning the policy network in these discussions, the PNMA **aims to assist and advocate with partner institutions/organisations for the implementation of the policy**

solutions previously identified, while monitoring ongoing experiences and welcoming new practices.

During the 2025 process, the **expansion of advocacy and consolidation of the policy network** continued, with close assistance of the Leadership Panel and IGF Secretariat, so the impact of good practices is amplified. The PNMA offers itself as a **benchmark for the implementation of the GDC**'s meaningful access objectives. Moreover, its output report continues to be a **public portfolio of knowledge and activities** that the PNMA can engage in and contribute to the WSIS+20 process after the UN renewal and onwards to GDC implementation.

1.4 2025 Goals

1. **Develop the PNMA's unique value proposition (UVP) within the WSIS+20 process:** define the benefits of the policy network clearly, explaining its benefits in different technical/nonexpert formats, why it is different from the rest, and why the internet governance ecosystem needs it.
2. **IGF 2025 Norway, as a halfway milestone to the WSIS+20 High-Level Meeting, will work as a consultation phase for our work**. We shall use the PNMA Plenary session to tackle the defined goals for the year, showcasing both the UVP knowledge and community practices that prove concepts and values of Meaningful Access policies.
3. With the close assistance of the IGF Secretariat and the Leadership Panel, **actively promote the tested concepts above** throughout regions and institutions, so their impact is amplified.
4. **Build the 2025 output report as the public portfolio of knowledge and activities that the PNMA can engage on and contribute to the WSIS+20 process.** Feature the PNMA as the **benchmark for the implementation** of GDC's meaningful access objectives.
5. **Improve the cooperation with other intersessional partners such as the NRIs, DCs, Best Practice Forums and other partners of the IGF process** on their experiences of meaningful access, amplifying the voices of the least advantaged groups.

1.5 Focus Areas and Methodology

- **Connectivity** (Infrastructure & Business Models)
- **Digital Inclusion** through a citizen-centric approach (accessibility & multilingualism: local services and contents in local languages based on local needs and resources)
- **Capacity Development** (technical skills training).

The focus areas are being explored by asking the following questions, which will lead the achievement of 2025 goals and priorities:

- What has been done so far?
    - Analyse gaps in policy

- What are the main challenges for project scaling?
    - Document loopholes via public debate/consultation
- What are the common features which allow a project to be localised/scaled?
- What are the social elements that support meaningful access?
- Is there any tested, multistakeholder business model that can be replicated into one or all of the analysed focus areas?
- How to promote and improve good access and connectivity, so Internet use could produce positive social and economic impact?
- How to promote and improve the quality of connectivity to support civic engagement and e-government experiences and services?
- How could multistakeholder partnerships be strengthened?
- Is there a gap in networking, implementation, or continuity?
- Is there any relevant case of A.I. application that has contributed to increase the meaningful access experience in some areas or for certain categories? Are these experiences replicable elsewhere and scalable?

1.6 The incremental road 2021-2025

Officially starting its activities in June 2021 – building on the experience of the Best Practice Forum on Local Content initiated in 2018 and rechartered in 2019, among other intersessionals –, the Policy Network on Meaningful Access (PNMA) has successfully built a network of partners (its Multistakeholder Working Group - MWG); arranged connections with ongoing relevant discussions and actions in other fora; and built a repository of good practices. As decided during its foundation, the MWG "agreed to explore concrete actions the members of the PNMA could support so that [our] main outcome is not only a set of recommendations"[4].

In 2022, the PNMA's analytical focus was on the community's agreed three overarching thematic workstreams: Connectivity (Infrastructure & Business Models), Digital Inclusion through citizen approach (accessibility & multilingualism: local services and contents in local languages based on local needs and resources), and Capacity Development (technical skills training). During that year's intersessional activities, the policy network actively contributed within and outside IGF communities to identify a certain number of good practices and policy solutions, and retain them as models to be exported or applied to other regions of the world. Stakeholders from different groups joined this enterprise: government, international organisations, academia, private actors, non-profits. The *2022 PNMA Output Report* features a collation of selected cases for each of the focus areas. Additionally, one section of the document is devoted to recommendations around meaningful access and its expansion.

During 2023, the PNMA expanded its analysis of said experiences with the implementation and problem-solving of the issues previously raised. By building a *PNMA Repository of Good Practices*, the network was able to assess reasons to why practices have or have not expanded; why digital divides

[4] *Statement of IGF 2021 PNMA Multistakeholder Working Group*.

persist, and which structural issues repeat themselves in different scenarios. Throughout online monthly deliberations and the outcomes of the plenary discussion held in Kyoto, the community shared examples of how we are working towards enlarging the availability of local content and languages online; improving meaningful connectivity in remote areas, and the use of non-Latin alphabets, amongst other examples. Additionally, the policy network encouraged conversations about the intersessional work and ways of collaboration and advocacy with other IGF areas (e.g., Dynamic Coalitions and National and Regional Initiatives), the Leadership Panel, and institutional partners. Amongst these, cooperation has been renewed with IGOs such as the Internet Corporation for Assigned Names and Numbers (ICANN); the International Federation of Library Associations (IFLA); the International Telecommunication Union (ITU), and the World Intellectual Property Organization (WIPO). The *2023 PNMA Output Report* reflects the collaborative work and the group's list of recommended actions on meaningful access.

In 2024, the PNMA contributed to assisting and advocating for the implementation of policy solutions for the key issues previously raised, while monitoring ongoing experiences and welcoming new practices. The continuous multistakeholder public debate on the above-mentioned focus areas took into account the deliberations from NETMundial+10; the WSIS+20 and IGF+20 processes; and the Global Digital Compact: a process to which the PNMA has actively contributed, and has welcomed with great satisfaction its final text and recommendations adopting the concept of meaningful access. That year's *Process* was supported by a follow-up monitoring survey of previously presented cases, as well as a review of the key policy issues raised in earlier output reports, and a revamped selection of new, community-endorsed good practices. Additionally, the policy network engaged in discussions regarding this intersessional work and ways of collaboration with IGF's Leadership Panel and Dynamic Coalitions, and institutional partners such as the Internet Corporation for Assigned Names and Numbers (ICANN); World Intellectual Property Organization (WIPO); the UN and its agencies International Telecommunication Union (ITU), UNDESA, UNHCR, and UNESCO; Internet Society (ISOC), and Organisation of American States (OAS), amongst others.

Following the *2024 commitment to the multistakeholder public debate on Internet governance and encouraged collaboration* to **build together the future that will be defined during the ongoing WSIS+20 process,** the PNMA 2025 Work Plan underlines the **policy network as the appropriate benchmark model for the implementation of meaningful access objectives as established by the Global Digital Compact (GDC).** The present output report is planned as a public portfolio of knowledge and practices that the PNMA can engage with and contribute to the above-mentioned pivotal milestones by applying the presented methodology and work strategy. A Roadmap towards the WSIS+20 High Level Meeting in December 2025 reflects the network's objectives (please see Section 3).

The *2025 PNMA Main Session* in Lillestrøm served as the portfolio showroom of selected good practices in connectivity, digital inclusion with multilingualism, and capacity development brought in by the PNMA community members, doers, and users alike. The panel reflected a good snapshot of a diverse group: governments, NGOs, technical community, academia, private sector, Youth, and NRIs from Latin America, North America, Europe, Africa, and Asia. The contributions emphasized dialogue and action towards meaningful access, policy challenges, community networks, Indigenous communities, and the role of digital equity in underserved areas.

1.7 PNMA and the WSIS+20 process: a benchmark for GDC implementation

The discussions in Riyadh closed the 2024 PNMA Process on a good footing: its output report reflects the goals and priorities defined by the community and pinpoints to policy and practice to solve them. During the policy network's plenary session, special guest Vint Cerf highlighted that "access that isn't useful can't be meaningful." He focused his statement on the importance of proper measurement of said access - considering security, utility, affordability, and accessibility - and on the good work that the PNMA has been doing on the topic. As a yearly process, the policy network can timely follow discussions and respond to quick changes in technology. As Chair of the Leadership Panel, Vint Cerf stated that a message to the UN Secretary-General on the permanence of IGF, regarding the upcoming WSIS, is being prepared: "Our work is not done. Our work continues to be extremely important, and I believe that we should persist, beyond the WSIS+20 timeline".

In 2024, proper recognition and support for access policies were included in the Global Digital Compact (GDC) document, which embraces the concept and importance of meaningful access. The PNMA leadership has actively participated in these consultations and events. The policy network also believes that this recognition is the right way to ensure connectivity through the provision of content in local languages and the establishment of services that actually improve the community's livelihoods.

The Policy Network on Meaningful Access reaffirms its commitment to the multistakeholder public debate on Internet governance; offers itself as a model for the implementation of the GDC built on policies based on best practices; and welcomes new like-minded partners to build together the future that will be defined during the ongoing WSIS+20 and IGF+20 processes.

Complementing the roadmap, the Policy Network on Meaningful Access will continue with the ongoing updates and expansion of the public *Repository for Good Practices* and the endorsed *Literature List on Meaningful Access*, along with strengthening networks and improved cooperation with NRIs, DCs, Youth, and other IGF partners. Moreover, the PNMA looks forward to promoting its agenda with the close assistance of the IGF Secretariat and the Leadership Panel on outreach and engagement activities. This concept is demonstrated in the following graphic.

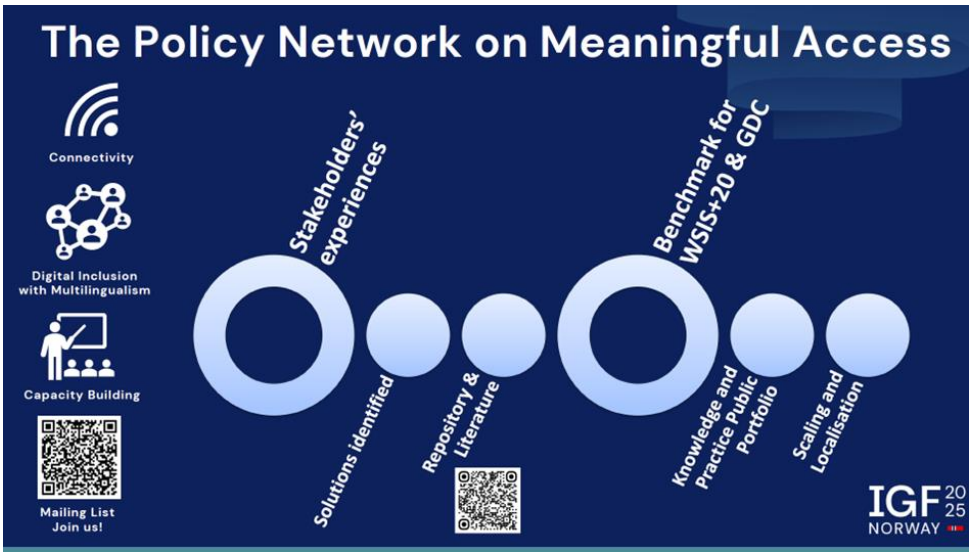

Figure 1 - PNMA Components and Solutions

2. PERSISTENT POLICY ISSUES IDENTIFIED (2021 – 2025)

Over the course of its existence, the PNMA community has narrowed down the causes below as recurring issues for access implementation globally:

- Persistent digital divide in gender, geography, age, disability, and other socioeconomic markers:
    - The effect of digital exclusion is more severe in vulnerable communities and leaves long-term consequences if urgent actions are not in place to avoid harm. A prioritised matrix for policy intervention is available in *Annex II*[5].

- Inadequate data to assess and monitor the progress of digital inclusion efforts:
    - Reliable measurement tools are needed - after many years of discussing policy loopholes, it is now clear that reliable tools to frequently measure where the issues persist are still in demand, as well as to assess policy effectiveness. Alternative solutions for such measures, beyond direct regulation, can be explored to avoid unnecessary burdens.

- Lack of affordable and reliable infrastructure in remote and rural areas:
    - Access is not possible without affordability - the price of access (of services, devices, and infrastructure) persists as one of the main barriers to connectivity. This needs to be urgently addressed if we really want all of humanity to join the Internet.

A whole-of-society approach while dealing with meaningful access is essential: connectivity, digital inclusion, and capacity development goals may only be achieved by multistakeholder cross-collaboration and multidisciplinary operating lenses.

[5] Courtesy of PNMA member GNKS Consult - the table is also included in the *PNMA's contribution to the WSIS+20 Zero Draft*.

3. THE PNMA AS A BENCHMARK TO GDC IMPLEMENTATION

The PNMA functions as a technical and operational partner to the GDC. The PNMA framework provides quantifiable and qualitative indicators that can serve as benchmarks for measuring GDC progress. While the GDC is normative and strategic, defining *what* the international community should aim for in digital governance, the PNMA provides policy evidence, frameworks, and markers that operationalise what *meaningful access* actually entails. This would ensure that the digital future being built is not only connected, but also empowering and inclusive.

3.1 Proving concepts and value

3.1.1 For Connectivity

The notion of meaningful connectivity is essential for understanding the qualitative dimension of digital inclusion, as stated by the G20 Digital Economy Working Group report *Universal and Meaningful Connectivity: A Framework for Indicators and Metrics*, from August 2024). The report emphasizes that universal and meaningful connectivity (UMC) goes beyond simply connecting individuals to the Internet. It is defined as a condition in which "everyone can access the Internet optimally and affordably whenever and wherever needed"[6] — enabling people to enjoy a "safe, satisfying, enriching, and productive online experience at an affordable cost" [7]. This understanding reflects the multidimensional nature of connectivity, encompassing not only access but also quality, affordability, devices, skills, and security. Meaningful connectivity ensures that connection translates into real empowerment, participation, and inclusion in the digital society.

The report highlights that achieving meaningful connectivity requires a holistic approach that integrates social, economic, and technological factors. Measuring connectivity only by access or usage rates conceals deep inequalities across populations and regions. The G20 framework thus proposes a multidimensional measurement model, focusing on six interrelated dimensions: connection quality, availability for use, affordability, devices, digital skills, and safety and security. These dimensions reveal that disparities in speed, affordability, or device adequacy can significantly affect individuals' ability to benefit from digital opportunities. By adopting this comprehensive view, policymakers can move beyond infrastructure deployment to address the underlying barriers that determine whether connectivity is truly meaningful for all.

Finally, meaningful connectivity is closely linked to the Global Digital Compact (GDC) and the Sustainable Development Goals (SDG). The report reiterates that *affordable, reliable, and meaningful connectivity* is pivotal to unlocking the potential of digital and emerging technologies, particularly in advancing AI governance, information integrity, and equitable access to digital services. It calls on governments and stakeholders to develop common targets and metrics for universal and meaningful

[6] G20 Digital Economy Working Group. *Universal and Meaningful Connectivity: A Framework for Indicators and Metrics*, August 2024, p. 12.
[7] Idem, p.11.

connectivity by 2030, supported by innovative financing mechanisms and inclusive governance models. In this context, meaningful connectivity emerges not merely as a policy goal but as a prerequisite for digital rights, participation, and sustainable development, ensuring that no one is left behind in the digital era.

The *PNMA Literature List* brings forward access to the above G20 publication as well as other connectivity-related reports collated throughout the year.

3.1.2 For Digital Inclusion

Digital inclusion ensures everyone, regardless of socioeconomic status, age, ability, or geographic location, has access to the opportunities and resources the digital world offers. It promotes equitable access to education, healthcare, employment, and social connection, while reducing disparities and fostering economic growth. By bridging the digital divide, societies can empower individuals, strengthen communities, and drive innovation and inclusivity in a rapidly evolving digital landscape. Over the years, the PNMA has noted the growth of best digital inclusion practices focusing on marginalised groups: women and girls, persons with disabilities, Indigenous/traditional communities, and displaced persons/refugees. It not only focuses on traditional connectivity issues but also on cultural and linguistic issues.

This year, two of the good practices presented at the PNMA Plenary Session focused on language and cultural preservation of distinct Indigenous groups. Being the 20th IGF in Norway, the first case focused on keeping the Sami languages and those of other Arctic-located communities alive. Open source technology and mobile apps created language mapping and various different language models that were trained on several texts. The resources and resulting tools that are developed by the language communities are fully governed and controlled by themselves: the collected corpus is divided into licensed and free access, with the latter available to everyone. Additionally, working with open source applications enables cooperation and allows for different ways to cover the needs of the Indigenous communities.

The second case highlighted the preservation of cultural diversity as the world goes digital. The target groups were Indigenous peoples in remote areas of Papua New Guinea (PNG): how to preserve art and languages of these rural communities, ensuring they are not lost as life becomes online – there are over 800 language communities at risk in the country. To tackle the issue, it is important to address it from the perspective of cultural heritage protection, which is paramount in several countries in the Pacific.

The Mariwai Project showed how cultural heritage - tangible or intangible - can be stored, preserved, and transmitted back to source communities, using models for protecting sacred and culturally sensitive content. Examples can be found around the world: in Australia, for instance, one of the tools is employing content warnings with blurred images and clear warning signs that require user confirmation. Smaller developing countries can implement something similar by adopting mechanisms and protocols that recognise that traditional knowledge, sacred sites, and ceremonial practices should not be digitised or shared without proper cultural authorisation. These decisions must be made by the Indigenous community or their tribal leaders, as they are the cultural custodians of the art.

Culture is not something to be simply put away in museums or hidden in books; it lives within us, and it needs to be shared for future generations to know where they came from and who they want to be. While viewers are amazed by the intricate carved sculptures, they are missing the stories and the

context behind them. A couple of questions raised in such observation connect to traditional practices: e.g., are there some parts of the art too precious to display, since communities' beliefs connect them to their spirits or ancestors? Is public viewing invasive of the group's intimate feelings and cultural understanding? Institutions that display such traditional art should work with the local communities to understand the best way of safeguarding their culture, while having them as the central piece of the process - so they understand the significance of the art, the stories and the cultural heritage behind it.

There needs to be a way to transmit the culture and history of the community so it will not be lost, and to help the museums that own these works understand a bit more about them, so that their history is not lost.

In September 2025, a complementary project started in PNG. In celebration of the country's 50th Independence anniversary, the *WanBel Global Exhibition* is a pioneering initiative advancing digital inclusion, digital repatriation, and ancestral futurism for Papua New Guinea. It shares the same curation and artistic direction as The Mariwai Project, and its main goal is the return of cultural heritage to PNG through digital platforms, overcoming physical and social barriers. The exhibition champions community-engaged reinterpretation of ancestry and culture, facilitating access, cultural pride, and intergenerational learning. It underscores the importance of a Digital National Archive (DNA) to consolidate, preserve, and share PNG's dispersed museum collections as an accessible, sustainable cultural resource. More details about the curation, implementation actions and results of both projects are available in *Annex III*.

Highlighted to the PNMA community by one of our members, another case worth mentioning is the initiative *From Rapa Nui to South America: how communities are claiming their languages online*. Across the globe, thousands of languages remain absent from the digital world, creating barriers to knowledge, healthcare, and education. For communities like Rapa Nui (Easter Island) and the Mapuche in Chile, this absence contributes to digital exclusion and - what many call - digital colonisation.

In 2023, the Chilean National Center for Artificial Intelligence (CENIA), in partnership with Estudios Aplicados Antropología UC and Indigenous institutions, launched *Internet for Everyone*. Funded by the Internet Society and its Foundation's BOLT program, the project enhanced the largest open-source translation engine and created a specialised tool designed with direct community participation. The translator is already showing results by revitalising endangered languages such as Rapa Nui and Mapudungun, and supporting everyday communication in schools, public services, and family life. By releasing the tool as open source, CENIA has paved the way for global replication, showing that technology can help decolonise the Internet and ensure that linguistic diversity thrives online. For implementation steps, please find the case presentation in *Annex III*.

3.1.3 For Capacity Development

Most documents coming out of the *WSIS+20*, *Network of the Future*, and GDC processes are released with multiple references to the need for capacity building, but often with little indication of what that means or what exactly needs to be done. The *Zero Draft* has fewer references but its section on Capacity Development breaks out some of the specifics - for example, an emphasis on "enhancing the capacity of developing countries to innovate and participate fully in building an inclusive, people-centred and development-oriented Information Society"[8], the need to take "into account the specific

[8] WSIS+20. *Zero Draft*, Capacity Development, §67.

social, cultural and linguistic needs of each society and persons of all ages and backgrounds"[9], and "the need to build digital literacy in order to empower individuals with the skills and knowledge needed to identify reliable information (…)[10]".The next step is a tactical one of how this is to be done.

It is the PNMA that carries forward the tactical task of not only reviewing the work that is being done in capacity building, but also developing ways to incorporate new goals and methods into existing practice. The PNMA has the challenging task of helping to coordinate the many efforts, existing and yet to be discovered, into a coherent set of actions that avoids duplication and builds on the good practices that are already in place; those that can be seen in various good aspects and projects of the existing WSIS programs and those of other international bodies, such as the technical community efforts that have capacity building among their goals and achievements.

Capacity building, as in financing - a closely related deficiency in data and internet governance - is a term that is often used without an explanation of the breakdown of its components and its varieties. Conversation is often limited to a single abstract concept of capacity development without any discussion of what it means. Does it mean the development of technology and policies that are people-centred and that raise people's ability to preserve and develop their human rights and standards of living? Or does it mean developing skills at using existing technology, perhaps developed elsewhere, in a manner that gives people access to education, markets, or interactions with government and other services? It is, perhaps, limited to just making sure that access, once gained, can be trusted and used safely? Does it include raising the general ability of practitioners in the field to understand new technologies before they attempt to create governance and regulatory policy? Does it include ensuring that those from developing economies are kept apprised of the latest technological developments and are able to utilise them for their developmental purposes? Does it include educating the young and old alike on use and regulation of technologies? In many ways, it includes all of the above and many more, a constantly growing set of needs that increases at least as quickly as the fields under Internet governance increase. According to the Zero Draft, capacity building includes "the sharing, transfer and development of technology, and financial resources to promote equitable access and innovation"[11]. In serving the many abstract goals of capacity development, it is necessary to identify the actual goals and means for achieving them.

In addressing the population to whom capacity development is directed, the Zero Draft addresses the "diverse needs and challenges faced by countries in special situations, in particular African countries, Least Developed Countries (LDCs), Landlocked Developing Countries (LLDCs) and Small Island Developing States (SIDS)"[12]. To go further, it includes the needs of those with differing abilities, no matter where they might domicile. There have been times when the term *capacity* has seemed derogatory to those from developing economies, Indigenous groups, or those with disabilities. They all know that they have great capacity in many areas and find the indication that the savants from other regions presume to give them capacity somewhat insulting. Whether this is intentional or not, it is a didactic problem. When trying to provide the tools that a population may need to advance in the technological or policy areas, it is best to not only include those people in the planning, but to build on the many capacities the people and their culture bring with them. This is made more difficult if the tasks are approached in a one-size-fits-all or in a manner that presumes superiority by those with the specific skills being transmitted. An early part of capacity building requires understanding the existing capacity and learning methods of the learning parties, and adjusting methodologies to those realities.

[9] WSIS+20. *Zero Draft*, Capacity Development, §68.
[10] Idem, §69.
[11] WSIS+20. *Zero Draft*, Introduction, §4.
[12] Idem.

It is important to remember that in any capacity building process, both the teachers and the taught should be learners.

The Zero Draft brings in an additional capacity that is sorely needed in the current age of disinformation, a capacity the whole world is largely deficient in. For this, we all need to learn new techniques for discerning what is the case from what is not, of being able to recognise the doctored from the genuine, and of understanding when it is better to look for confirmation than to spread a false word or picture.

In moving forward, the work of the IGF, including its working groups, policy networks, and dynamic coalitions, needs to take into account its starting point, the work already being done, and the base capacity that already exists. There also needs to be coordination of the many efforts, some of which have been discussed recently and for many years in the annual IGF meetings, with the new work that needs to be done. Additionally, as is often repeated, there needs to be sufficient funding support for any development program.

3.2 Institutional and community-bound knowledge

3.2.1 PNMA Repository

By building a public *repository*, the PNMA was able to explore reasons on why digital divides persist, and which structural issues repeat themselves in different scenarios. Throughout the online monthly deliberations and the plenary discussions held so far, the community shared examples of how we are working towards better practices on meaningful access and whether their scaling is viable or not. This institutional memory is found in the Repository, which is updated yearly. A sample of new cases and updates added in 2025 is found in Annexes *I* and *III*.

3.2.2 Literature List

Given the success of the Repository, the Policy Network now collates a list of referenced publications on meaningful access; similarly to the former, updates are performed yearly and encompasses materials presented in monthly meetings, at the plenary sessions, and collected as part of success cases. The *PNMA-endorsed literature* is available on our webpage.

3.3.3 Measurement Tools

As mentioned in *Section 2*, the lack of reliable measurement tools has been a persistent issue that hinders the proper analyses of policies' effectiveness. To address the problem, the United Nations Educational, Scientific and Cultural Organization (UNESCO), one of PNMA's institutional partners, has launched an initiative to promote access, inclusion, and empowerment through an indicator's framework.

The *Internet Universality Indicators (IUI) ROAM-X Framework* is grounded in the principles of human (R)ights, (O)penness, (A)ccessibility, (M)ultistakeholder participation, and (X) cross-cutting issues—

such as gender equality, trust, and sustainability. The tool enables countries to assess their digital environments and generate evidence-based policy recommendations. The IUIs go beyond diagnosis by translating complex evidence into actionable policy insights that directly support universal and meaningful access. Their implementation facilitates inclusive, data-driven dialogue among diverse stakeholders at the national level, fostering transparency, shared understanding, and long-term ownership of digital policy priorities while ensuring that every stakeholder's voice is heard in digital policymaking. The current IUI framework comprises 133 indicators in total, including 88 core indicators and 49 core questions. These indicators cover a broad range of dimensions — from human rights and legal frameworks to access, digital skills, and institutional governance — and are designed to be both rigorous and adaptable. Countries can apply the full set or focus on the core indicators to suit their policy priorities and data capacities. This balanced structure ensures that the framework remains globally consistent while being flexible enough to accommodate local contexts and priorities.

The IUI framework is also closely aligned with the objectives of the UN Global Digital Compact (GDC), particularly in meaningful connectivity, AI governance, information integrity and platform regulation. Through its rights-based, evidence-driven approach and multistakeholder nature, the IUIs offer a concrete mechanism for countries to assess progress toward the GDC's vision of a safe, open, and inclusive digital future.

One example worth citing is the application of the IUI in Brazil supporting the development of concrete public policies and regulations in the country. The first national assessment from 2019 recommended action points that were targeted by the country in the following years, e.g., the creation and consolidation of a national data protection authority and the use of the Universal Telecommunications Services Fund to expand internet access in public schools. The IUI implementation also highlighted significant gaps in data generation, such as the lack of disaggregation by gender and by people with disabilities, pointing to the need to improve statistical methodologies and ensure more inclusive policies. In 2025, the preparation of a new report (forthcoming) offers an opportunity to update assessments and address emerging issues. Topics such as the social and ethical implications of artificial intelligence and the regulation of digital platforms are now at the centre of the agenda, expanding the relevance of the IUI as a tool for policy monitoring and guidance. This process strengthens transparency and Brazil's ability to adapt its digital policies to a constantly evolving landscape, in alignment with international norms. More on this Framework in *Section 4.8.2*.

Equally valuable contributions are being developed by another PNMA member. Since May 2023, the International Telecommunication Union (ITU) and the European Commission (EC) are working together in the project *Promoting and Measuring Universal and Meaningful Digital Connectivity*. On a global level, the goal is to enhance the statistical capacity of countries to measure different aspects of universal and meaningful connectivity (UMC) with greater accuracy, timeliness, and granularity. For that, advocacy, data collection, and capacity development are being implemented. One of the results worth mentioning is the publication of *guidelines* for statistical measurement of UMC in partnership with the Brazilian G20 Presidency. More ITU activities can be found in *Section 4.4*; an update to this case was added to the Repository and replicated in *Annex III*.

4. BUILDING BRIDGES IN AND OUT OF THE IGF ECOSYSTEM

Different stakeholder groups are members of the PNMA; the community is truly intersectional. Our members work together for the improvement of meaningful access and are supported by other IGF activities (e.g., Dynamic Coalitions and National and Regional IGF Initiatives), the Leadership Panel, and institutional partnerships beyond the Forum. Some of them are the Internet Corporation for Assigned Names and Numbers (ICANN); International Federal of Library Associations (IFLA); International Telecommunications Union (ITU); World Intellectual Property Organization (WIPO), and United Nations Educational, Scientific and Cultural Organization (UNESCO). This report section refers to ways of collaboration in this ecosystem to influence policy change.

4.1 IGF Leadership Panel statement on the PNMA

> *"The PNMA has worked with members of the Leadership Panel (LP) since before the LP was created. The relationship with the LP is strong and the LP confirms the value of the PNMA both by engagement and endorsement. It is the intersessional scope of PNMA that the LP sees as its main value. Persistent work during the year in addition to PNMA-led sessions at the annual IGF provide continuous opportunity for surfacing governance issues, taking timely actions during the year, and engaging with other elements of the IGF ecosystem, especially other policy networks and dynamic coalitions with similar persistent agendas. With regard to the specific foci of PNMA, the LP confirms that the PNMA work captures a broad spectrum of benefits and deficits that determine whether Internet access and use is truly of value in specific venues. Moreover, the PNMA analyses shed light on opportunities for intervention in similar conditions around the world. Internet implementation and use vary among countries, locales and cultures and PNMA evaluations expose these differences and similarities, leading to concrete steps for improvement. Regardless of the fate of the WSIS and IGF, it is hoped that the PNMA might persist in its work beyond 2025, but it has been significantly enabled by support from the IGF Secretariat and PNMA's own leadership".*
>
> Vinton Cerf
> Chair, IGF Leadership Panel

4.2 Intersessional work: Dynamic Coalitions (DCs) and National and Regional Initiatives (NRIs)

Work continues to create alignment with DCs and NRIs on several key issues, specifically focusing on the GDC, the WSIS +20 review and related topics. All of the intersessional communities have worked together to put forward panels, discussions, and contributions. Amongst these, it is worth highlighting the Dynamic Coalition on Accessibility and Disability (DCAD), which was present in the 2025 PNMA process throughout the year and has recently published its *accessibility guidelines* for all to follow. We are thankful for the generous donation of time by members of DCs/NRIs for translating the guidelines

into multiple languages. We equally highlight the participation of NRIs as speakers in the Plenary Session (Gambia IGF and Colombia IGF).

4.3 Intersessional work: Youth representatives

Albeit in small numbers, Youth has frequently been present at the PNMA monthly meetings, as well as in our Plenary Sessions. The Policy Network wishes to improve the cooperation with this important stakeholder group, to learn from their experiences of meaningful access and serve as a means to amplify their voices. A statement on the PNMA focus areas from a Youth representative can be read below:

> *"The concept of meaningful connectivity for young people must move beyond simple coverage maps to address the qualitative aspects of access, particularly as it relates to their future prosperity. For the global youth population, connectivity is the critical enabler for education, economic opportunity, and civic participation, directly shaping their roles as future digital citizens. Ensuring truly meaningful access therefore requires addressing the unique challenges faced by Youth, which include the demand for affordable and high-speed broadband to support data-intensive educational needs; reliable infrastructure in underserved rural communities; and affordable digital devices. In addition, access must be inclusive of digital safety and well-being, particularly for young citizens who face unique challenges related to online harassment, identity management, and pervasive misinformation.*
>
> *True development of capacity development for young people is not merely about providing isolated technical training, but fundamentally equipping them with the holistic digital competencies required to thrive in the future economy. For Youth globally, capacity development must be viewed as an imperative that shifts them from being passive consumers of technology to active creators, innovators, and leaders. This requires comprehensive programs that go beyond basic digital literacy to include advanced skills like data analysis, artificial intelligence (AI), and green technology, while simultaneously fostering crucial soft skills such as critical thinking, collaboration, and digital entrepreneurship. As the largest user base and future stakeholders, youth empowerment must be central: this involves not only training them but also actively listening to, implementing, and co-creating solutions based on their vision, ideas, and pressing issues. Furthermore, initiatives must be localised, culturally relevant, and intentionally inclusive, ensuring that marginalised communities - including girls, those with disabilities, and those in remote areas - are proactively reached and empowered to fully participate in the digital transformation and contribute meaningfully to their communities.*
>
> *By adopting innovative business and delivery models that are inclusive and focused on youth-led development, meaningful access can be transformed from a basic utility into a powerful tool for empowerment, enabling young people to build their own digital futures."*
>
> Omor Faruque
> Youth leader, Bangladesh
> Founder, *Project OMNA*

4.4 International Telecommunications Union – ITU

ITU is a founding member of the PNMA and has been actively engaged in our activities every year. Since 2023, we have closely followed the updates regarding the ITU/EC project *Promoting and Measuring Universal and Meaningful Digital Connectivity*, one of the measurement tools mentioned in *Section 3.3.3*. Funding for the project is now secured until February 2027; so far, more than 500 professionals from around 160 countries' National Statistical Offices, ICT Ministries and regulators have been briefed about the UMC policy principle and its measurement. It has been also communicated at international fora of statisticians, policymakers, diplomats, and humanitarian NGOs.

Issues around the absence of statistical knowledge are persistent in developing countries. This affects not only the capacity for producing, but also of using statistics. The adoption of the GDC opens an opportunity window as it sparks demand for ICT data for its monitoring and includes a commitment to strengthen the corresponding statistical systems. However, the financial resources much needed to implement household surveys on access and use of ICT – the scarcest source of data to monitor progress towards UMC - are not yet identified. A complete update of ITU's latest activities and newly discovered challenges on this front is available in *Annex III*; a comparison of incremental changes can be performed with the support of updates sent to the *Repository* in previous years.

Two new publications will soon be launched: *Measuring digital development: Facts and Figures 2025* and *The Global Connectivity Report 2025*. Their referred links will be available to the public by November 6th and November 25th, respectively.

4.5 World Intellectual Property Organization – WIPO

The World Intellectual Property Organization (WIPO) works under the premise that meaningful access is intrinsically connected to the creation and distribution of meaningful content of different natures, such as educational, news reporting, or pure entertainment (e.g., music, videogames, audio-video – AV). Content is meaningful if it is inclusive, affordable, culturally relevant, and easily accessible in local languages. The Organization has provided the PNMA with updates to three of its activities, firstly presented in the *2023 PNMA Output Report*.

4.5.1 Accessible Books Consortium

The *Accessible Books Consortium (ABC)* is a public-private partnership led by WIPO, consisting of organisations that represent the visually impaired and people with print disabilities, such as the World Blind Union, and libraries. ABC's goal is to increase the number of books available in accessible formats (such as digital braille, e-pub, audiobooks) and to distribute them around the globe. WIPO acts on this through a variety of lines of work, including capacity building and advocacy for inclusive publishing. It is worth mentioning that the most impactful part of ABC activities is the *ABC Global Book Service*: the most diverse online catalogue of books in accessible formats available at no cost to authorised entities serving people who are print disabled. The Service currently offers over 1.1 million titles in 80 languages (against 840,000 titles in 2023) and is available for cross-border exchange under the terms

of the *Marrakesh VIP Treaty*[13], without the need for copyright clearance formalities. Of the 148 Authorised Entities (AEs) that have joined the ABC Global Book Service, 87 are located in developing or least developed countries (LDCs). In 2024, participating AEs distributed nearly 225,000 accessible format copies from the ABC Catalogue to persons with print disabilities.

The recent collaboration between the ABC Global Book Service and Dolphin Computer Access - a UK-based developer of accessibility software - deserves special mention, since it significantly extends the availability of accessible books to end-users. This partnership has integrated the ABC catalogue into the free, and widely used Dolphin EasyReader app. This allows users who are blind, visually impaired, or print disabled to search for, download, and read accessible format titles directly on their preferred device (Windows, iOS, Android and others). As of October 20, 2025, access to ABC catalogue is available through the EasyReader app to end-users belonging to Authorized Entities in countries that have implemented the Marrakesh Treaty, and which have accepted ABC's Terms and Conditions.

4.5.2 Open Access (IGOs Working Group)

As previously mentioned in the *2023 PNMA Output Report*, since 2010, WIPO has led a Working Group formed by over 100 individual members from 25 international organisations facilitating the debate and exchange of good practices among IGO publishers moving to open access. Recently, those organisations indicated their interest in having WIPO lead the discussion on Open Access licenses applicable to Artificial Intelligence, a topic that many IGOs are currently struggling with and would like to better navigate. WIPO organised an initial informative session where an overview of the main elements and the legal implications were shared, as well as some experiences within IGOs that developed and are deploying AI systems, including those with open access features.

4.5.3 Development Agenda - Creative Industries in Developing Countries (CDIP)

Digital technologies continue to impact the creative industries and how content is created, distributed and consumed. Under the CDIP Development Agenda umbrella, a *pilot project* focused on the digital distribution of audiovisual content in Latin America commissioned a study to clarify the current status of artificial intelligence in the audiovisual sector and hence assist audiovisual producers to better understand the implications of applying AI tools in their work. Additionally, the pilot project on *Text and Data Mining (TDM) to Support Research and Innovation in Africa* is promoting awareness and building capacities at universities and other research-oriented institutions to use TDM. The objectives are to facilitate the use of AI tools, create and disseminate knowledge on TDM through documenting best practices by universities or research institutions in the region, and build capacities of local staff.

[13] *Marrakesh Treaty to Facilitate Access to Published Works for Persons Who Are Blind, Visually Impaired, or Otherwise Print Disabled*. WIPO, 27 June 2013.

4.6 European Broadcasting Union / World Broadcasting Unions – EBU/WBU

The community of broadcasters around the world (gathered within the WBU and composed of six regional unions) is also facing the same problem of connectivity in every house. Currently, the unions have the obligation to reach the whole population of a country with tv and radio signals. Today this happens through hertzian waves transmissions, but tomorrow probably the signals will have to pass through the Internet. Therefore, how to reach an entire population if a third of the world citizens are not connected?

One of the solutions the broadcasting community is working on (and that could be of interest for the PNMA community) is the technology of 5G Broadcasting. A technological solution that combines the usage of broadcasting distribution and of mobile internet could reach nearly everyone on mobile phones. This system is currently in the test phase in many countries and it could provide essential information and services to the entire population whenever needed.

The progressive development of open distribution formats (e.g., IP formats compatible with multiple physical networks) has created the premises of a holistic way of delivering live or on demand contents to a variety of end devices. Today, it is possible to combine multiple delivery systems to optimize distribution of content. Details of these activities are included in the *5G Broadcast* material provided by EBU, which was added to this year's *PNMA Literature List*.

4.7 United Nations Department of Economic and Social Affairs – UN DESA

The United Nations Department of Economic and Social Affairs (UN DESA) serves as a central entity within the United Nations system, dedicated to advancing sustainable development globally. Its mandate includes fostering international cooperation on economic, social, and environmental issues, delivering policy analysis, and supporting Member States in achieving the 2030 Sustainable Development Goals (SDGs).

Within UN DESA, the *Division for Public Institutions and Digital Government (DPIDG)* plays a pivotal role in leveraging digital transformation to support sustainable development. The United Nations E-Government Survey, published biennially by DPIDG, is the only global comparative assessment of digital government across all 193 Member States. The 2026 edition will mark the 15th Survey, continuing a consistent methodology firstly adopted in 2003. The Survey presents relative trends and rankings in e-government development through the E-Government Development Index (EGDI), a composite index comprising the Online Service Index (OSI), Telecommunication Infrastructure Index (TII), and Human Capital Index (HCI).

Since 2018, the Survey has also assessed local e-government development through the Local Online Services Index (LOSI), enabling a comparative analysis of city portals and highlighting the critical role of municipalities in delivering digital services and advancing the SDGs at the local level.

As a development tool, the Survey provides policymakers with evidence-based insights and policy options to identify contextual strengths and challenges and to chart pathways for mobilizing digital government in support of the SDGs. Each edition has generated strong interest among Member States,

serving not only as a benchmark to track progress, but also as a knowledge platform for learning from global, regional, and local experiences and for guiding policy formulation in priority areas.

The Survey is expected to be launched in 2026 Fall. For more, please visit the *UN e-Government Knowledgebase (UNeGovKB)*. Data from the *2024 Survey* is also available online.

4.8 United Nations Educational, Scientific and Cultural Organization – UNESCO

In the modern world that has become increasingly digitised, UNESCO has been tasked to promote inclusive knowledge societies, shaping inclusive, rights-based, and ethical digital transformations that advance sustainable development and human dignity. To achieve this goal, the Organization has multiple initiatives that advance information accessibility and multilingualism, consistent with the policy goals at the core of the PNMA, the Global Digital Compact (GDC) and the WSIS +20 Review. They are briefly mentioned below, with more details included in *Annex IV*.

4.8.1 Digital Inclusion and Meaningful Connectivity: Exploring Emerging Issues

To realise this goal, UNESCO's *Information for All Programme (IFAP)* serves as a unique platform for fostering digital inclusivity and equitable digital transformation, focusing on six priority areas: Information for Development, Information Literacy, Information Ethics, Information Preservation, Information Accessibility, and Multilingualism. IFAP is dedicated to enhancing information accessibility for all communities, especially the most vulnerable. Its *Strategic Plan for 2023-2029* was recently updated to prioritise bridging digital divides and promoting inclusion for women, girls, rural communities, and persons with disabilities. It ensures all individuals can create and access digital and AI-driven content in their local languages, addressing inequalities both within and between countries and communities.

To facilitate the policy dialogue, IFAP is extensively involved in organizing events and forums related to the International Day for Universal Access to Information (IDUAI): the Programme's Working Group on Information Accessibility organized the sixth Artificial Intelligence for Information Accessibility (AI4IA) Conference with the theme of "AI Access in Focus", which provided a multidimensional perspective on AI's role in society. Another venue for knowledge sharing is the IFAP Brief Series, which provides policy recommendations on the topic. A highlight is the September 2025 Brief *Global Challenges for Information Accessibility: Key Principles and Good Practices in the Digital Age*, which examines national best practices targeting connectivity and universal access. A publication exploring the role of library networks as vehicles for increased accessibility to information, enabling many individuals without private access to the Internet to gain digital experience and literacy, is in production.

4.8.2 Internet Universality Indicators (IUI) ROAM-X Framework

Previously mentioned in *Section 3.3.3 - Measurement Tools*, the *ROAM-X Framework* launched by UNESCO in 2018 has deployed its IUIs in over 40 countries across all continents and in a wide variety of contexts - from small Pacific island developing states to large developed and emerging economies as Germany, Brazil and Senegal. This global reach demonstrates the adaptability and universality of the framework. Regardless of size, income level, or technological advancement, each country has been able to use the IUIs to identify gaps, set national priorities, and track progress toward an Internet environment that is rights-based, open, accessible to all, and governed through inclusive participation.

In conjunction with the activities developed in *Brazil* on meaningful connectivity, recent exercises illustrate this impact: in *Fiji*, UNESCO supported a national workshop bringing together key actors from government and the private sector to jointly plan the implementation of follow-up actions from the ROAM-X assessment, in alignment with the country's digital transformation strategy. Major findings and outcomes of the IUI reports for the *Solomon Islands*, *Tonga*, *Tuvalu*, and *Vanuatu* have also been released, along with the first-ever regional IUI report for *the South Pacific*.

By enabling countries to assess and improve their digital ecosystems through a rights-based, inclusive, and evidence-driven approach, the IUI ROAM-X Framework directly supports the realisation of meaningful connectivity.

4.8.3 Multilingualism and Linguistic Inclusion for Meaningful Connectivity

The *Recommendation concerning the Promotion and Use of Multilingualism and Universal Access to Cyberspace* was adopted by the UNESCO General Conference in 2003 to encourage equitable access to information and knowledge online. It promotes the use of multiple languages in digital spaces to ensure cultural and linguistic diversity, besides encouraging the development of inclusive technologies that enable all language communities to fully participate in the digital environment, including speakers of Indigenous and minority languages.

To transform words into action, UNESCO is leading the following activities:

- The *International Decade of Indigenous Languages (2022-2032)*: a global UN initiative to promote, revitalise, and preserve Indigenous languages worldwide, ensuring Indigenous Peoples can access and share information in their own languages. A key focus is on bridging the digital divide by fostering inclusive technologies and platforms that support Indigenous language learning, communication, and cultural expression. Recently, IDIL helped organize the celebration of the 2025 International Translation Day.
- The *Global Roadmap for Multilingualism in the Digital Era*: provides a strategic framework for advancing language technologies, promoting linguistic diversity, and ensuring all language communities can thrive in the digital age. Developed in response to the urgent call for action from different contexts, particularly from the February 2025 Language Technology for All (LT4ALL) Conference and discussions taking place under the umbrella of the previously mentioned initiative, the Roadmap proposes a way forward to address current disparities in language technology development and deployment. UNESCO continues to monitor Member States' progress on the roadmap and compiles regular reports.

4.8.4 Open Solutions: Open Educational Resources, Open Data and Open Access for Scholarly Communications

Meaningful access means more than connectivity; it ensures that knowledge is openly licensed, freely available, and adaptable across languages, disciplines, and contexts. Through *Open Solutions*, UNESCO supports its member states in building inclusive, interoperable, and sustainable digital ecosystems that empower all learners and researchers to participate fully in the knowledge society.

At the core of this work are the *Open Educational Resources (OER)*: teaching, learning, and research materials in any medium that are either in the public domain or released under open licences allowing free access, reuse, adaptation, and redistribution. Guided by the *2019 UNESCO Recommendation on OER* and working with the *OER Dynamic Coalition*, UNESCO promotes capacity building, inclusive policy design, quality assurance, sustainability, and international cooperation to mainstream OER worldwide - the Recommendation's five action areas are available for consultation in *Annex IV*. The *Dubai Declaration on OER (2024)*, a guidance tool for implementing the 2019 Recommendation on OER using emerging technologies and AI, further reinforces these principles, outlining shared priorities and actions for governments, institutions, and stakeholders to harness OER and open solutions for promoting access to knowledge, fostering innovation in teaching and learning, and supporting the achievement of SDGs.

Open Data and software code preservation serve as transversal enablers within UNESCO's Open Solutions portfolio. Open Data ensures that educational, scientific, and cultural information is interoperable, verifiable, and connected to its evidential base, aligning with the FAIR (Findable, Accessible, Interoperable, Reusable) and CARE (Collective Benefit, Authority to Control, Responsibility, Ethics) principles. Software code preservation, in turn, safeguards research integrity, reproducibility, and innovation by ensuring that the tools underpinning knowledge production remain accessible, reusable, and sustainable over time. Together, these components reinforce an ethical, transparent, and rights-based approach to digital transformation.

UNESCO's Universal Access to Information team works on digital inclusion and reaffirms that AI systems and digital tools must be co-created with disabled professionals, not merely designed for them as end users. This principle lies at the heart of the Dubai Declaration's call for participatory governance and resonates strongly with the *UNESCO's Guidelines on Open and Distance Learning (ODL)*, which emphasizes that inclusivity begins at the design stage.

In conclusion, Openness is a foundational enabler of meaningful connectivity, ensuring that digital transformation advances not only technological inclusion but also equitable participation in the global knowledge society. In alignment with the Global Digital Compact's vision for an open, free, and secure digital future for all, OER and Open Access advance the principles of digital public goods and universal access to information.

4.9 International Centre for Theoretical Physics – ICTP / UNESCO

For the third year in a row, ICTP has concentrated parts of its yearly research plan on technologies that could provide connectivity in rural, remote and difficult areas. The 2025 research projects were

presented in Trieste, Italy, between 22nd and 26th September. In the workshop entitled *Empowering Connectivity: Bridging Space and Earth with DTN*, most of the studies presented focused on the possibility to employ technologies and protocols developed for interplanetary Internet - such as the Delay Tolerant Networks (DNT) - as tools to bridge the gap of unconnected areas on Earth.

DTN protocols allow the exchange of data packets in an asynchronous way, without the need for direct communication links. At first designed for space missions, its benefits could be applied to places with unreliable or inexistent connectivity. The PNMA leadership has joined the event and selected the five projects below as the most interesting and promising ones:

- Mehran Behjati, Sunway University, Malaysia: development of a solution of networks of remote sensors installed in remote areas at risk (e.g., floods, pollution of protected areas, landslides) that could send signals to balloons or drones in order to ensure the constant monitoring of markers or indicators that are important to prevent major catastrophes.
- Moncef Zarrouk, ENSIAS – Mohammed V University in Rabat, Marocco: the current landscape in agriculture is the employment of very accurate local models but weak or intermittent links, alongside data extracted by sensors with stable connections but poor data quality. Hence, the project tackles the deployment of Internet of Things-based (IoT) remote sensors in agriculture to provide coordination and prevention data into a system that would work without intermissions even in conditions of poor or unstable internet connections. The data could be collected through DTN and AI could be used to extract meaningful information.
- Suraj Dangol, Center for ICT4D, Nepal: development of a network of sensors installed in remote areas at risk of debris and flash floods. The IoT network could be transformed into efficient Early Warning Systems, as it could constantly monitor the situation on the ground of such sources of risk and automatically send alerts to the soon-to-be affected community via SMS, radio, or sirens.
- Samo Grasic, LateLab AB, Sweden: development of the project *DTN-of-Things: Reindeer Tracking in Sweden*, launched in partnership with Sami reindeer herders, Luleå Technical University (LTU), and the Interplanetary Networking Special Interest Group (IPNSIG) to monitor the movement of the reindeer herders in the Arctic region. The solution consists of providing GPS tracking collars to reindeers; the long battery life of 2-5 years keeps all data stored in the transmitter itself, which only exchanges packets when a relay station is available. The project will provide accurate tracking of reindeers' movement across harsh and unpopulated areas. The research does not request data collection in real time as it focuses on the accuracy of migration data from inhospitable places to humans.
- Mike Jensen, Rhizomatica, Mexico: introduced the device Hermes, a "delay tolerant HF radio device for long distance autonomous digital communications"[14]. The system enables long-distance voice and data communication (until 1000km) without Internet or satellite, and on a very low power consumption. Its small size and weight - 2kg - allows it to be mounted on boats or bikes, transmitting and receiving data, voice, text and file exchange with other similar stations. In the aftermath of natural hazards, it could be used to quickly reestablish connectivity between affected areas.

Supporting materials for all these highlighted cases are available at the *event webpage* and *ICTP website*.

[14] Jensen, Mike. *Hermes Presentation at ICTP 2025*.

4.10 International Federation of Library Associations – IFLA

IFLA, as the main representative for libraries within the PNMA, has had a successful year in developing tools for capacity building on media literacy. To start, the *IFLA Internet Manifesto* has been fully updated with key principles the library sector should take into account about the Internet as a fundamental medium to guarantee access to information and knowledge. In April 2025, IFLA and UNESCO jointly adopted the *School Library Manifesto 2025*, an important and useful tool for school library advocacy, facilitating digital inclusion and connectivity. Additionally, their *Media Literacy Case for Educators (MLCE) project* developed guidelines to facilitate creating and knowledge sharing processes from both the library staff and the user perspectives, addressing themes such as Screentime, Algorithms, AI, Environmental Impact of Technology, Gaming and the Labor behind Technology. The tools are being translated into several languages and can be adapted and scaled to different contexts.

IFLA has also submitted new best practices to the *PNMA Repository*; these can be found in *Annex III*. The above referred publications were included in the *Literature List*.

5. THE 2025 IGF PNMA MAIN SESSION: DRIVING IMPACT WITH POLICY AND PRACTICE

The Main Session served to showcase the Roadmap towards the WSIS+20 High Level Meeting, highlighting the Policy Network's core activity as a benchmark for the implementation of meaningful access objectives as established by the Global Digital Compact - complemented by this report, serving as a public portfolio of knowledge and practices that the PNMA can engage with and contribute to the above-mentioned pivotal milestones.

Participants were introduced to several of the good practices in connectivity, digital inclusion with multilingualism, and capacity development brought in by the PNMA community members. The panel reflected a good snapshot of a diverse group: government, NGOs, technical community, academia, private sector, Youth, and NRIs from Latin America, North America, Europe, Africa, and Asia. Each contribution shed light on a specific topic of meaningful access, e.g., policy challenges, community networks, access from Indigenous communities, and the role of digital equity in underserved areas.

As a key message, it was registered that meaningful access is one of the benchmarks of the whole process of transition to the new digital world. Not only we need to connect the next 2,5 billion unconnected people, but we also need to provide to all of the connected useful and meaningful services in their own languages, adapted to and respectful of their cultures and traditions.

Within the PNMA activities, it was decided that it is imperative to follow through with the repository, improving and enriching its database with best policies from around the world that have proven to be successful in diverse groups with different needs. Meaningful access needs to be adaptive to specific needs of every community, and especially of the most vulnerable. Hence, the Policy Network welcomes all efforts employed by its multistakeholder partners to assist, incentivise, promote, and measure meaningful access following the 2025 examples presented by its institutional members UNESCO, ISOC, ITU, ICANN, IEEE, IFLA, APC, and GDIP; by various governments such as Norway and Papua New Guinea; and by the technical community/academia. Moreover, with the close assistance of the IGF Secretariat and the Leadership Panel, a call to action was raised to build a permanent dialogue between the PNMA community and regional and global actors (such as the EU, the AU, the OAS or other similar institutions) to encourage projects' replication and scaling up.

For a full report of the event, please access the *2025 PNMA Main Session* page.

6. WSIS+20 REVIEW AND CONCLUDING REMARKS

The PNMA activities in 2025 have reflected the goals and priorities defined in its yearly work plan. From the monthly discussions to the Main Session in Norway, the following community suggestions were collated, as policy recommendations on how the Policy Network can move its impact forward and make it permanent.

ACTION ITEM	STATUS
Update and expand the online public repository for good practices and the endorsed Literature List on Meaningful Access	Ongoing, with yearly updates
With the close assistance of the IGF Secretariat and the Leadership Panel, actively promote outreach and engagement activities around the PNMA agenda, so our efforts are amplified	Ongoing, with room for improvement
Strengthen networks and encourage new connections for advancing meaningful connectivity	Ongoing, with room for improvement
Improve the cooperation with NRIs, DCs, Youth, and other partners of the IGF process on their experiences of meaningful access	Ongoing, with room for improvement
Submit to the WSIS+20 co-facilitators the PNMA pitch as implementation benchmark for the GDC	Completed for the Zero Draft. Ongoing for future Draft 1 and for New York UNGA debate.

With active participation in the GDC's consultations and events, the PNMA now continues its task of proper recognition and support for access policies within the WSIS+20 process. To start, we provided written inputs to the *WSIS+20 Review Elements Paper*, with some of the suggestions being incorporated in the following version.

The above mentioned *PNMA pitch* was submitted as a written input to the *Zero Draft* and is publicly available alongside other contributions at the *WSIS+20 Process webpage*. The Policy Network leadership attends its preparatory meetings and consultations, providing interventions about the network's model and collaboration venues around its cumulative knowledge and practice. We expect that further suggestions will now be included in the next draft version to be provided at the UNGA session in December, where a decision will be taken about the future of WSIS.

As a network and within their own, the PNMA members will continue to invest in research, policy analysis, and impactful, cooperative ways to ensure meaningful access for everyone.

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ANNEXES

Annex I – PNMA Institutional Memory

- *PNMA Repository / Literature List*
    - Last update at the time of publishing: November 2025
- *PNMA Contribution to the WSIS+20 Zero Draft*
- *2025 PNMA Work Plan*
- *2025 PNMA Plenary Session*
    - *Recording*
- *2024 PNMA Output Report*
- *2023 PNMA Output Report*
- *2022 PNMA Output Report*

Annex II – Prioritized Matrix: Digital Divide Groups[15]

Group	Impact if unaddressed	Urgency	Why prioritise
Children & disadvantaged students	Very high – permanent loss in education, skills, life chances	Very urgent	School closures & e-learning highlight the gap; long-term inequality hard to repair
Low-income households	High – exclusion from jobs, e-government, banking, health	Urgent	Affordability barriers directly widen inequality in digital societies
Rural & remote communities	High – systemic lack of broadband, economic isolation	Medium	Requires infrastructure investment; delay compounds economic lag
Women & girls (esp. in restrictive contexts)	High – limits access to education, jobs, civic life	Urgent	Gender digital gap is large in Africa, Asia, MENA; addressing it boosts overall development
Elderly people	Medium – exclusion from health, government, financial services	Urgent	Digital-by-default public services risk leaving them behind today
People with disabilities	High – barriers to employment, education, autonomy	Medium	Accessible design is possible today but adoption remains uneven
Migrants, refugees & homeless	High – loss of access to services, legal status, jobs	Medium	Connectivity crucial for integration and survival; policy gaps exist
Ethnic & linguistic minorities	Medium – loss of cultural relevance, limited participation	Medium	Language & content diversity often overlooked
Indigenous peoples	Medium – systemic isolation, cultural erosion	Medium/Low	Infrastructure + culturally relevant content essential for long-term resilience
Workers lacking digital literacy/reskilling	Medium – structural unemployment, exclusion from digital economy	Medium	Skills gap grows as automation/AI advance; mid/long-term risk

[15] Table courtesy of GNSK Consult, a PNMA Member.

Annex III – Best practices identified in 2025: new and updated cases

This annex collates cases that were mentioned in the output report as well as collected by our community during the past year. They are classified following the PNMA's focus areas.

a. Connectivity

Case C01 (2024 practice with 2025 updates):	ITU-D: ICT Promoting and Measuring Universal and Meaningful Connectivity
Location:	Global
Funding:	EUR 3 million funding from the EU Global Gateway program from May 2023 to February 2027
Responsible institutions / partners / people:	ITU-D/DKS/IDA (ICT Data and Analytics Division) / EU Commission (partner)
What is the problem?	Depriving vast swaths of humanity from the possibilities offered by the Internet is costly, deepens inequalities and undermines development. Over the past 30 years, the number of Internet users surged from a few million to 5.5 billion. Yet the potential of the Internet for social and economic good remains untapped: one-third of humanity remains offline, and many users only enjoy basic connectivity. Multiple digital divides persist across and within countries, between men and women, between youth and older persons, between cities and rural areas, between those who enjoy a fibre connection and those who struggle on a spotty 3G connection. UMC is the new imperative. To maximize its impact on society and the economy, digital connectivity must be universal and meaningful. "Universal connectivity" means connectivity for all. "Meaningful connectivity" is a level of connectivity that allows users to have a safe, satisfying, enriching and productive online experience at an affordable cost. The two dimensions are complementary: neither universal connectivity with poor quality nor meaningful connectivity for the few will yield significant, society-wide benefits. At the same time, the two dimensions obviously reinforce each other: more use can lead to more meaningful connectivity, and vice versa.
Which were the actions taken to address the problem(s)?	ITU and the European Commission (EC) have joined forces in the context of the project "Promoting and Measuring Universal and Meaningful Digital Connectivity." Through advocacy at the global, regional, and country levels, the project aims to mainstream UMC and encourage countries and their partners to adapt their digital strategy from a narrow focus on infrastructure to a holistic approach that includes the other enablers of connectivity. The project will monitor and report on progress towards achieving the UMC targets. It will enhance the statistical capacity of countries to measure various aspects of UMC with greater accuracy, timeliness, and granularity. The project will also identify best practices and policy recommendations to accelerate progress towards UMC. Four workstreams are being implemented. **1. Advocacy:** • Sessions in UN system events, World Telecommunication Indicators Symposium (WTIS), G-20, IGF, and other global and regional events • Mentions of UMC in Global Digital Compact • G20 Guidelines on Measuring UMC • Creation of digital communication assets, social media campaigns

	• A UMC Data hackathon to uncover undeserved areas and populations using data science **2. Data collection and dissemination** • Aspirational targets for the UN SG Roadmap on Digital Cooperation • UMC website, including a UMC Dashboard • Online course on the collection and use of UMC indicators (in partnership with ITU Academy) • Manual on ICT price basket statistics and on measuring ICT skills • Exploratory use of secondary data sources to support UMC measurement 3. **Capacity building:** 8 regional workshops for users and producers of UMC statistics • A dialogue between users and producers of statistics. • A solid understanding of the concept of universal and meaningful connectivity. • Greater awareness of the critical role of data in policymaking and the ability to advocate for investment in data infrastructure and capabilities. • Improved capacity to produce reliable data on UMC. • One Summer School on Evidence-based Digital Policies organised. **4. Evidence-based research on effective interventions towards achieving UMC** • Global Connectivity Reports 2025 and 2026 • Regional and thematic analyses
Results / Impact / Lessons learned (what worked / remaining challenges)	**Results:** • More than 500 professionals from around 160 countries' National Statistical Offices, ICT Ministries, and regulators have been briefed about the UMC policy principle and its measurement. It has been also communicated at international fora of statisticians, policymakers, diplomats, humanitarian NGOs. • Contacts between users and producers of ICT statistics to monitor progress towards UMC have been strengthened. The first Summer School on Evidence-based Digital Policies was organised with UNU-Merit (Univ. of Maastricht) • Guidelines for the statistical measurement of UMC have been established by joint work of the Brazilian G20 Presidency and the ITU, publicly available in the project web. The South-African G20 Presidency has highlighted the need for financing ICT statistics, in accordance with the Global Digital Compact. **Lessons learned:** • There is a need for sustainable dialogue between users and producers of ICT statistics at the national level, including on the financial resources that should be devoted. The capacity for using ICT statistics by policymakers should be continuously increased. • Focusing the measurement debate in low-dimensional, composite indicators hides the many inequalities of meaningful connectivity within countries, as well as the different paths towards UMC that countries may adopt. Instead, a rich multivariate set of indicators covering the different dimensions of UMC can help better identify policy alternatives. • Regional cooperation multiplies the efforts, by establishing contacts, exchange of best practices and decreased data collection costs by sharing solutions. **Remaining challenges:** • A significant number of developing countries have weak statistical systems and low levels of connectivity. This is a vicious circle where lack of data hampers the design of efficient policies towards UMC. • The lack of skilled staff and financial resources are barriers to statistical development. There is no earmarked international funding for statistical systems on UMC.
2025 Update	
Has the problem been solved?	The problem of lack of statistical capacity is persistent in developing countries. This affects not only the capacity for producing, but also of using statistics. A proposal to finance digital inclusion surveys is being discussed with the World Bank.

	The problem of lack of meaningful connectivity is not directly addressed by the project, except indirectly by improving the evidence base for digital policies.
Did any new problems emerge during implementation?	The regional events have fostered demand for technical assistance by countries to improve their ICT statistics. This demand cannot be satisfied without additional resources.
Do 2023/2024 solutions still work to tackle the problem? New solutions needed to be developed?	Project resources have been reallocated to allow for more events to train producers and users of ICT statistics.
Was the solution scaled or localised to other regions? If so, please share examples	The plans for the remaining implementation period include three more training courses for users and producers of ICT statistics (in collaboration with UNU-Merit and CETIC Brazil).
New milestones:	-
New challenges:	The adoption of the Global Digital Compact by the UN General Assembly in 2024 opens an opportunity window as it sparks demand for ICT data for its monitoring and includes a commitment to strengthen the corresponding statistical systems. However, the financial resources much needed to implement household surveys on access and use of ICT – the scarcest source of data to monitor progress towards UMC - are not yet identified. Establishing a financial facility to support household surveys on digital inclusion in low-income countries would definitely improve the availability of statistical evidence in countries with serious gaps in achieving UMC.
Lessons learned:	(see above)
Next steps:	• Summer Schools on Evidence-based Digital Policies in 2026 (Maastricht, Bangkok) • 3 Regional events on Promoting and Measuring UMC in Africa • UMC Data Hackathon (*UMC Data Hackathon - UMC*) • Publication of Global Connectivity Report 2025 at the WTDC 2025. • Developing a proposal with the World Bank for financing digital inclusion surveys • Creating a dashboard on ICT statistics capacity • Strengthening the communication and research activities

Case C02:	Self-sustaining Financing Solutions for Community Connectivity
Location:	Global
Timeframe:	2024-Ongoing
Funding:	The development of this publication is part of the *Meaningful Community-centered Connectivity* project being implemented by APC and the LocNet initiative, with financial support from the Swedish International Development Cooperation Agency (Sida) and UK International Development (FCDO) through its Digital Access Programme.
Responsible institutions / partners / people:	• Fundação Getulio Vargas (FGV) • Association for Progressive Communications • Rhizomatica
What is the problem?	The primary challenge is the persistent digital divide that has left nearly one-third of the world's population offline particularly women, rural communities, and Indigenous peoples. To address this gap, community-centred connectivity initiatives (CCCIs) have emerged as transformative solutions. Community networks (CNs), once grassroots experiments, have evolved into key instruments for advancing digital inclusion, human rights, and digital sovereignty. These networks embody the principle of "network self-determination" the right of communities to design, build, and manage their own digital infrastructure as a common good. Community-driven connectivity thus presents an economically viable and socially empowering alternative, diversifying the digital ecosystem beyond dominant corporate operators. The core problem addressed is: 1. Lack of financial sustainability for community connectivity/community networks (CNs). Many community-driven connectivity initiatives depend heavily on grants, donations, or short-term project funding, which is unpredictable, fragmented, and often tied to donor agendas rather than community needs. These funding sources are insufficient to support long-term operations, maintenance, infrastructure upgrades, and scaling. 2. Inadequate access to capital and mismatched financial instruments. Traditional financial mechanisms (e.g. loans, investment instruments, Universal Service Funds) are designed for large operators and infrastructure projects, not small-scale, bottom-up, community-led initiatives. Community networks struggle to access or adapt these instruments. 3. Regulatory and structural barriers. Regulatory regimes, licensing rules, spectrum access, and the design of Universal Service Funds often favour incumbents and exclude community actors. This compounds the financial challenge by restricting what CNs can legally do, making risk higher for investors and limiting revenue models. 4. Lack of rigorous evidence on cost-effectiveness, social impact, and investment-readiness. The movement needs better empirical data to show that CNs can deliver social value, cost-effectiveness, and returns (or acceptable social returns), to attract new types of financing (impact investment, blended finance, etc.).
Which were the actions taken to address the problem(s)?	Since this is a policy and research publication rather than a single project, the actions focus on analysis, framing, and developing practical models for sustainable community connectivity. **1. Typology and Mapping of CCCIs** The publication looks at different types of community-centred connectivity initiatives. Some are fully owned and run by the community while others work with NGOs, governments or small private operators. They also use different kinds of technology from small Wi-Fi networks to licensed spectrum systems. This shows that financing and sustainability approaches need to fit the local context instead of using the same solution everywhere. **2. Case Studies from Asia, Africa, and Latin America**

	Case studies from multiple regions reveal that CCCIs face high CAPEX costs which limit their growth. Despite this demand for connectivity is strong with 30–50% of local households adopting the services. Revenue generation varied across cases including user subscriptions, tiered pricing systems and subsidies or vouchers for low-income users. Some networks diversified their income by offering community Wi-Fi, digital training and local services. Beyond financial metrics the studies highlight that CCCIs generate significant social value. They enable communication and access to online services, foster social inclusion through education and health information, and contribute to broader transformation through local entrepreneurship, women's empowerment, cultural preservation, and stronger community governance. In several cases the Social Return on Investment (SROI) exceeded 1:1, showing that the social and economic benefits outweighed the costs. However, these impacts are not captured by traditional telecom indicators like subscriber numbers or revenue per user. **3. Analysis of the financial divide and barriers** First most traditional financial instruments and investment models are designed for large telecom operators and cannot easily support small community networks. Loans and private investment are often unavailable or too expensive because funders see the initiatives as high risk due to small scale, unpredictable revenue streams, and limited collateral. Grants and donations can help cover initial costs but are unpredictable and usually short-term, creating sustainability challenges. Policy frameworks, licensing rules, and Universal Service Funds often favour large incumbents and make it harder for community networks to operate or scale. Even when community networks demonstrate clear demand and social impact, they face regulatory hurdles that increase perceived risk and limit investment options. **4. Proposals and frameworks for alternative financing models** To address these barriers, the publication outlines several approaches and financing frameworks that could make community networks more sustainable. • One key idea is blended finance, which combines grants, concessional loans, and private investment to reduce risk and make projects viable. Impact investing is highlighted as a way to attract investors who care about social outcomes in addition to financial returns. • The report also explores community-based financial instruments such as community currencies or tokenization, where local value or digital tokens can help fund networks while keeping control within the community. Cross-subsidies and hybrid funding portfolios are proposed to balance revenue from paying users with support for low-income households. • Finally, the publication emphasizes redesigning Universal Service Funds to explicitly include community networks as eligible recipients, creating a more level playing field for access to funding. **5. Advocacy and Policy Guidance** Financial sustainability alone is not enough for community networks to succeed in the long term. Regulatory and policy reforms are essential to create an environment where community-centred connectivity initiatives (CNs) can thrive. This includes integrating CNs into national digital inclusion strategies, adapting licensing and spectrum rules, and designing Universal Service Funds and other financing instruments to support community networks explicitly. Sustainability should be seen not just as technical or financial but also as legal, social, and rights-based. Community networks often serve marginalized populations, and their success depends on clear legal recognition, protection of spectrum rights, and supportive policy frameworks that allow them to operate and grow while remaining community-led.
Results / Impact / Lessons learned (what worked / remaining challenges)	**Results / Impact** • Demonstration of financial and social viability: case studies from Asia, Africa, and Latin America showed that many CNs could cover operating costs and deliver significant social value, even if full infrastructure cost recovery remained rare. Adoption rates of 30–50 percent among eligible users demonstrate real demand. • Evidence of social returns: Several initiatives had Social Return on Investment (SROI) ratios above 1:1, indicating that the social value created—through

	education, health, women's empowerment, local business support, and community governance—exceeded the costs. **Lessons Learned / What Worked** • Combining grants, subsidies, user revenue, soft loans, and impact investments reduces risk and increases sustainability. • Measuring social impact alongside cost-effectiveness helps attract funders who care about both financial and societal returns. • No single model works for all contexts; financing, technology, and governance must be adapted to local conditions. • Enabling licensing, spectrum access, and inclusion in Universal Service Funds are key for scaling CNs and making them investable.

Case C03:	Libraries Boosting Connectivity (LOC)
Location:	Cameroon, Nigeria, Namibia, Zambia, Kenya, Iraq, Lebanon, Chile (all counties/all provinces)
Timeframe:	Started in September 2024. Survey/data collection remains open until May 2025 but final report will be published in August 2025. Follow up activities to be planned for end of 2025 and 2026.
Funding:	Stitching IFLA Global Libraries
Responsible institutions / partners / people:	It is an IFLA project (The International Federation of Library Associations and Institutions) but we have partnered with the African Library & Information Associations & Institutions (AfLIA), the Goethe Institute in Cameroon, Library Aid Africa, and held some talks with ITU GIGA people for feedback and support. We have also partnered with the Universal Postal Union (UPU) as they are doing a similar project.
What is the problem?	Lack of connectivity and digital-related data on libraries. While IFLA has an online platform called *Library Map of the World* that includes some geolocation data on libraries and information about their resources and collections, the only data we have on connectivity is the amount of libraries connected per country. This means we do not have information on the type, quality or permanence of the connectivity, the community needs, or the staff's digital skills, amongst many other indicators. In essence, we need more information in terms of libraries' digital infrastructure, skills, and initiatives in order to be able to support them and connect them with other stakeholders or funding opportunities. Particularly with public and community libraries, in many cases these are the only entry points of connectivity in many rural and underserved areas, representing a free and unique access to information and devices for the people who live there.
Which were the actions taken to address the problem(s)?	• Launched call to actions on different regions and regional coordinators hires to be in contact with the national library associations and networks in each of these countries • Open and disseminated survey containing information on the status of library connectivity, geolocation, digital infrastructure, digital skills of staff, particular needs of community members and digital-related initiatives they might be implementing in their communities • Obtained prototype website from web design agency as a pilot resource to fill in the data once the report is finished. Opportunities and challenges will be assessed based on the pilot website and report to either collect more data in the pilot countries or annex other possible countries to keep growing the database • Prioritizing pilot countries and public and community libraries but the project welcomes any library that wants to participate as it was also disseminated via the IFLA website.

Results / Impact / Lessons learned (what worked / remaining challenges)	**Results:** • Better understanding of digital related community needs at a local level • The results tell us a lot not only about libraries but also about the connectivity situation at regional and local levels • Very important to mention that we also surveyed unconnected libraries and we obtained very interesting data from this. It helped us understand the reason for their lack of connectivity that are often but not always related to infrastructure, high costs and/or electrical supply issues **Impact:** • Libraries look forward to the report and results as these will improve their capacity to collaborate locally to improve access to information. • At the same time, it will provide IFLA with a solid base to design tailor-made support for each of the communities • It opened opportunities to partner with other stakeholders and organizations working on connectivity in surveyed countries (e.g. UPU). **Lessons learned:** • Complementing information with other actors working on connectivity at a local level would be useful • Connected libraries are essential for bridging the digital divide in rural and underserved areas, the people who live in these areas depend highly on them to access all types of information often related to education, employment, and other opportunities that may significantly affect economic growth in the region.

b. Digital Inclusion

Case DI01:	*The Mariwai Project*
Location:	East Sepik Province, Papua New Guinea (PNG)
Timeframe:	2021-2024
Funding:	Self-funding, with charitable contributions and generated art sales.
Responsible institutions / partners / people:	• The Mariwai Project • Felix Trust for Art • Shiva Burgos, Founder / International Representative for Arts And Culture (National Cultural Commission), Special Envoy for Arts (PNG)
What is the problem?	• Digital Inclusion • Digital Rights • Cultural Protocols • Technology Access
Which were the actions taken to address the problem(s)?	• Community observation • Canvassing the needs and desires for digital technology • Working with village chiefs and community leaders • Recording intergenerational balance of power disruptions based on digital access • Evaluating the effects and vulnerabilities of misinformation • Observing stressors to adapt to a money economy to have access to smartphones, education and connectivity
Results / Impact / Lessons learned (what worked / remaining challenges)	• The Mariwai Project operates within a complex landscape of digital inclusion challenges that reflect broader patterns of Indigenous digital exclusion globally. While digital technologies offer powerful tools for cultural preservation and international engagement, their effective implementation requires careful attention to infrastructure limitations, gender and educational disparities, and sophisticated cultural protocols. • The experiences of First Nations communities in Australia provide valuable guidance for developing culturally appropriate digital frameworks, particularly regarding restricted cultural materials and community controlled access systems. Academic research demonstrates that successful digital inclusion initiatives must be community-led, culturally responsive, and attentive to the intersection of digital access with broader social and economic inequalities. • For The Mariwai Project to fully realize its potential as a model for traditional cultural preservation through digital inclusion, continued investment in community capacity building, culturally appropriate technology infrastructure, and collaborative governance frameworks will be essential. The project's success will ultimately depend on its ability to leverage digital technologies while maintaining Indigenous cultural sovereignty and appropriate protocols for sacred and sensitive materials. • Full project portfolio: *Bridging Access and Protection*

Case DI02:	***WanBel Global Exhibition Legacy***
Location:	Worldwide, focused on Papua New Guinea (PNG)
Timeframe:	September 2025 - ongoing
Funding:	Government, charitable contributions and grants
Responsible institutions / partners / people:	• The Mariwai Project • HELUX Foundation • PNG government • Shiva Burgos, Curator / International Representative for Arts And Culture (National Cultural Commission), Special Envoy for Arts (PNG)
What is the problem?	• Digital Inclusion and Digital Repatriation • Safeguarding digital disaster preparedness and resilience • Benefits for PNG and Local Populations • Developing a system to classify digital assets for preservation of culture, art, and language
Which were the actions taken to address the problem(s)?	• Community observation • Communicating the needs and benefits to leadership • Working with village chiefs and community leaders • Working with museum and institutional partners • Leveraging AI and algorithms to develop frameworks • Regular transparent reporting and risk management
Results / Impact / Lessons learned (what worked / remaining challenges)	• The WanBel Global exhibition is a pioneering initiative advancing digital inclusion, digital repatriation, and ancestral Futurism for Papua New Guinea (PNG). Curated by Shiva Lynn Burgos, the project returns cultural heritage to PNG through digital platforms, overcoming physical and social barriers. The exhibition fosters community-engaged reinterpretation of ancestry and culture, facilitating access, cultural pride, and intergenerational learning. It underscores the importance of a Digital National Archive (DNA) to consolidate, preserve, and share PNG's dispersed museum collections as an accessible, sustainable cultural resource. The initiative exemplifies leadership in restorative digital heritage stewardship, enhancing education, creativity, and cultural identity for PNG and its diaspora. Previously unknown assets have been successfully shared via screenings at major public events such as stadiums, the National Art Exhibition, and social media as well as a dedicated website: *wanbelglobal.com* • Protecting intangible heritage with data protection and privacy compliance by creating culturally appropriate, accessible digital frameworks foregrounds the creation of DNA. • Securing long-term educational and cultural access is feasible using the models of proven systems in museology archiving systems. We have the benefit of access to our nearly 50 participants in WanBel Global. • A model for traditional cultural preservation through continued investment in culturally appropriate technology infrastructure, and collaborative governance frameworks will be essential. A government owned archive database requires the co-operation of multiple Ministries. Long-term financial investment and local capacity building are essential for sustainability. • Full project impact and governance report: *WanBel Global Exhibition and Proposed Digital National Archive*

Case DI03:	***Reclaiming Indigenous Languages in the Digital Era***
Location:	Rapa Nui (Easter Island, Chile) and Indigenous communities in South America (particularly Mapuche communities in Chile)
Timeframe:	The initiative began in 2023 with the launch of the project Internet for Everyone: Towards Removing the Language Barrier for Underrepresented Languages on the Internet.
Funding:	• Internet Society reserve funds. • Internet Society Foundation through the BOLT (Building Opportunities/Leveraging Technologies) grant program.
Responsible institutions / partners / people:	• Centro Nacional de Inteligencia Artificial (CENIA) in Chile (lead institution). • Estudios Aplicados Antropología UC (EAA). • Indigenous institutions supporting the project.
What is the problem?	Although there is Internet access, most Indigenous languages (including Rapa Nui and Mapudungun) are not represented online, which creates an invisible digital barrier. This absence results in digital exclusion, limiting access to education, healthcare, administration, and participation in the online world.
Which were the actions taken to address the problem(s)?	• Development of a specialized online translation engine designed for language inclusivity. • Enhancement of the largest open-source translation engine to include 204 languages. • Close collaboration with Indigenous communities and institutions to ensure translations are culturally authentic. • Testing of the tools in Rapa Nui and Mapuche communities, enabling everyday use in education, public services, and family life. • Release of the tool as open-source software, allowing replication and adaptation for other underrepresented languages globally.
Results / Impact / Lessons learned (what worked / remaining challenges)	**Results / Impact:** • The translation tools have already had a positive impact in Rapa Nui and Mapuche communities. Teachers, public officials, and families can now access education, healthcare, and administrative resources in their native languages. The translator is helping to revitalize endangered languages, encouraging daily use, and engaging children and youth with their cultural heritage. It also acts as a bridge for non-speakers, allowing broader society to connect with Indigenous languages and cultures. • By being open-source, the project created a replicable model that other low-resource languages can adapt worldwide, amplifying its global reach. **Lessons learned:** • Community participation is essential — involving native speakers ensured cultural authenticity and greater acceptance of the tools. • Open-source strategy provided sustainability and scalability, making the project more than just a local effort. • The project showed that AI and translation technologies can be applied beyond efficiency or automation, becoming powerful tools for cultural preservation and inclusion. **Remaining challenges:** • The crisis of language endangerment remains: revitalizing Rapa Nui and Mapudungun require long-term, sustained use beyond digital tools. • Continuous improvement is necessary: feedback from native speakers showed that the translator still needs refinement to capture nuances. • Scaling globally requires additional funding, institutional support, and adaptation to each community's specific cultural and linguistic context.

Case DI04:	*Offline Internet Consortium*
Location:	Tempe, Arizona – USA
Timeframe:	2018 – ongoing
Funding:	Arcadia Fund and support for 20+ consortium members from many sources
Responsible institutions / partners / people:	• Ann Okerson, Director, Offline Internet – OLI • James O'Donnell, Arizona State University (steering committee member) • Stéphane Coillet-Matillon, CEO, *Kiwix* (steering committee member)

What is the problem?	• Global connectivity gap
	  ○ People with no broadband access
	  ○ People in network-adverse circumstances (censorship or political constraint, unable to afford broadband, need support for education, healthcare, refugee status, natural disasters etc.)

Which were the actions taken to address the problem(s)?	• Bringing together 20+ mainly local/regional organizations that do "offline internet" work with challenged populations
	  ○ Facilitate coordination and communication
	  ○ Connect people with needs to appropriate service providers and content
	  ○ Raise awareness
	  ○ Fundraising

Results / Impact / Lessons learned (what worked / remaining challenges)	• Results:
	  ○ Increased awareness
	  ○ Facilitated cooperation
	  ○ Thought leadership
	• Impact:
	  ○ Many specific local/regional stories from Africa, South America, Pacific islands, Ukraine, especially focused on primary and secondary education
	  ○ *List of Partners*
	• Lessons learned and biggest challenge: widespread assumption that magic technology solutions will make universal broadband a reality very soon
	  ○ A White Paper produced by OLI documents the ways in which forms of access to information make up a continuum tailored to specific needs and use cases: *The Power of Offline Internet*

Annex IV – UNESCO's contribution to meaningful connectivity

UNESCO takes a holistic approach to closing digital divides by addressing not only the lack of affordable and inclusive internet connectivity and persistent barriers to online access (such as limited languages and accessibility) but also the unequal digital skills and capacities within and between communities and countries. Its focus is on enabling people to use digital technologies and data constructively, ethically, safely, and in ways that support human rights and socioeconomic development. The following comments on its activities are complementary to *Section 4.8*.

a. ROAM-X Framework

It goes beyond measuring access by emphasising the quality, equity, and sustainability of digital inclusion. Through participatory assessments and policy dialogues, the framework helps ensure that connectivity empowers individuals and communities in using digital technologies to enhance education, livelihoods, civic engagement, and cultural expression. Both progress and persistent challenges are then highlighted, including issues with data gaps, limited resources and uneven policy follow-up.

b. Multilingualism and Linguistic Inclusion

UNESCO works to ensure meaningful access to information and knowledge for all, with special attention to the users of low-resourced, Indigenous, and signed languages. Inclusive language technologies, digital tools, and policy frameworks support linguistic communities in fully participating in the digital sphere, safeguarding their linguistic heritage, and exercising their right to communicate, learn, and share knowledge on an equitable basis.

c. Open Solutions and Open Educational Resources: Action Areas

UNESCO has been supporting Member States in implementing the *2019 UNESCO Recommendation on OER* through a series of policy briefs corresponding to each of its five action areas. These briefs translate the Recommendation into concrete steps and best practices for national and institutional implementation:

- Action Area 1: *Building capacity of stakeholders to create, access, re-use, adapt and redistribute OER*
- Action Area 2: *Developing supportive policy*
- Action Area 3: *Ensuring inclusive and equitable access to quality OER*
- Action Area 4: *Nurturing the creation of sustainability models for OER*
- Action Area 5: *Facilitating international cooperation*

Complementing OER, *Diamond Open Access* (OA) represents a non-commercial, community-driven model of scholarly publishing free for both authors and readers. UNESCO's engagement in global and

regional consultations has positioned Diamond OA within the broader Open Science framework as an equitable route to scholarly communication. The forthcoming consultation report, *Advancing Equity and Inclusion in Scholarly Communication: Findings from the Global Consultation on a Diamond Open Access Framework*, will further guide member states in implementing policies that reduce costs, enhance inclusiveness, and support multilingualism.

National and institutional implementation of these global frameworks (Open Solutions, OER, OA, 2019 UNESCO Recommendation on OER) is performed through a series of additional practical tools, including:

- Establishing and managing OER repositories to enable access, sharing, and reuse of educational materials;
- Integrating open procurement policies to foster adoption of digital public goods;
- Building a health knowledge ecosystem to ensure equitable access to medical and public health information for learning, research, and policymaking;
- Creating a digital inclusion toolkit for policymakers, featuring an inventory of best practices and tools for universal access to information.

d. Advocating for Multistakeholder Partnerships and Evidence-Based Achievements: Foreseeable Results

Moving forward, it is important to highlight UNESCO's efforts and its foreseeable results regarding knowledge, practice, capacity development/monitoring, multilingualism, and engagement. The IFAP Secretariat continues to expand the foresight-oriented IFAP Issue Brief Series and to develop National Committees and Working Groups to enable greater impact at national and regional levels, while fostering exchange of experiences across regions and different fields of expertise.

IFAP is not only committed to evidence-based research and policy but also to multistakeholder approaches that ensure the participation of a diverse group of actors. In addition to being an active member of the PNMA, another notable achievement within the IGF is the foundation of the Dynamic Coalition on Measuring Digital Inclusion (DC-Digital Inclusion), an IFAP-Global Digital Inclusion Partnership (GDIP) joint initiative. By September 2025, the coalition encompassed over 60 institutions globally, including universities, government agencies, international organisations, NGOs, and private sector organisations. Through the promotion of research, the implementation of programmes, and the launch of initiatives to raise awareness, the Dynamic Coalition will contribute to global efforts to bridge digital divides. A solid and continued member engagement is also an IFAP commitment towards the DC activities.

IDIL maintains its support for the development of National Action Plans, essential for translating the Global Action Plan of IDIL2022-2032 into national and local contexts. They define strategies and priorities, guide implementation efforts, and should be developed in close partnership with Indigenous Peoples' organizations, national authorities, and other stakeholders. Where structures are lacking, National Action Plans also help establish inclusive governance and partnerships for language revitalization. In similar fashion, UNESCO is preparing an Action Plan as a follow-up to the soon-to-be-launched Global Roadmap for Multilingualism in the Digital Era; additionally, it continues its work on multilingualism with its ongoing collaboration on Universal Acceptance with ICANN.

Finally, by transforming research into concrete action and building national capacity for inclusive digital governance, the ROAM-X Framework continues to help countries strengthen the foundations of an accessible, rights-based, and sustainable digital future.

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