POLICY OPTIONS FOR CONNECTING & ENABLING THE NEXT BILLION(S): PHASE II

DRAFT II: 30 November 2016

CONTENTS

EXECUTIVE SUMMARY

[To be included in final outcome document]

ACRONYMS & ABBREVIATIONS

3G	Third generation (wireless mobile telecommunications technology)
4G	Fourth generation (wireless mobile telecommunications technology)
A4AI	Alliance for Affordable Internet
AI	Artificial intelligence
APC	Association for Progressive Communications
APrIGF	Asia Pacific Regional Internet Governance Forum
BPF	Best Practice Forum (IGF)
Broadband Commission	Broadband Commission for Sustainable Development (UN)
ccTLD(s)	Country code top-level domain(s)
ccTV	Closed-circuit television
CN(s)	Community network(s)
CSTD	Commission on Science and Technology for Development (UN)
DC	Dynamic Coalition
EuroDIG	Pan-European Dialogue on Internet Governance
FDI	Foreign direct investment
GDP	Gross domestic product
GeSI	Global e-Sustainability Initiative
GSMA	Groupe Speciale Mobile Association
ICT(s)	Information and communication technology/ies (ICTs)
IDN(s)	Internationalised domain name(s)
IGF	Internet Governance Forum
IGO	Intergovernmental organization
IoT	Internet of Things
ISP	Internet service provider
ITU	International Telecommunication Union
IPv6	Internet Protocol version 6
ISOC	Internet Society
IXP(s)	Internet exchange point(s)
LDC(s)	Least developed country/ies
M2M	Machine-to-machine
MAG	IGF's Multistakeholder Advisory Group
MDG(s)	Millennium Development Goal(s)
MLATs	Mutual legal assistance agreements
NGO	Non-governmental organization
NRI	National and Regional IGF initiatives
SEEDIG	South Eastern European Dialogue on Internet Governance
SDG(s)	Sustainable Development Goal(s)
SMS	Short message service
STEM	Science, technology, engineering and mathematics
UN	United Nations
UNDESA	United Nations Department of Economic and Social Affairs
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNHCR	United Nations High Commissioner for Refugees
USF(s)	Universal service fund(s)
Web Foundation	World Wide Web Foundation
WSIS	World Summit on the Information Society

CONTEXT: THE IGF'S INTERSESSIONAL PROGRAMME

The United Nations (UN) Commission on Science and Technology for Development (CSTD) working group on Internet Governance Forum (IGF) improvements called for the development of more tangible IGF outputs to 'enhance the impact of the IGF on global Internet governance and policy' (2012:4).

The IGF multistakeholder advisory group (MAG) and the IGF Secretariat consequently launched an intersessional programme in 2015 with the aim of extending and increasing the impact of other IGF activities, such as National and Regional IGF initiatives (NRIs), Dynamic Coalitions (DCs) and Best Practice Forums (BPFs). To this extent, the ongoing programme *Policy Options for Connecting and Enabling the Next Billion(s)* is considered a unique opportunity for the IGF community to help address a complex challenge in a multistakeholder, bottom-up manner through the consideration of a diversity of perspectives.

The outputs from the IGF's community intersessional programme are intended to be dynamic resources and to evolve and grow over time. Working modalities for all intersessional activities include:

- the IGF Code of Conduct (2016) should be followed by all stakeholders involved in IGF community activities;
- community intersessional working groups have the freedom to define their own methodologies, tailored to each group's specific needs and requirements;
- for each intersessional activity/working track, the community concerned should discuss and decide on their respective working modalities in an open and transparent way using mailing lists and frequent virtual meetings; and
- decisions on working modalities should reflect support of the participants of the activities and should also be made in an inclusive and transparent manner.

Intersessional IGF initiatives such as *Policy Options for Connecting and Enabling the Next Billion(s)* furthermore aim to support the IGF's mandate as prescribed in paragraph 72 of the World Summit on the Information Society (WSIS) Tunis Agenda for the Information Society (2005); and particularly the need to:

- Discuss public policy issues related to key elements of Internet governance in order to foster the sustainability, robustness, security, stability and development of the Internet.

- Facilitate discourse between bodies dealing with different cross-cutting international public policies regarding the Internet and discuss issues that do not fall within the scope of any existing body.
- Interface with appropriate intergovernmental organizations and other institutions on matters under their purview.
- Facilitate the exchange of information and best practices, and in this regard make full use of the expertise of the academic, scientific and technical communities.
- Advise all stakeholders in proposing ways and means to accelerate the availability and affordability of the Internet in the developing world.
- Strengthen and enhance the engagement of stakeholders in existing and/or future Internet governance mechanisms, particularly those from developing countries.
- Identify emerging issues, bring them to the attention of the relevant bodies and the general public, and, where appropriate, make recommendations.
- Help to find solutions to the issues arising from the use and misuse of the Internet, of particular concern to everyday users.

The IGF thus aims to provide a unique platform for this collaborative intersessional work in order to collect the views of the broader Internet governance community on the topic of connectivity and meaningful access, and organize the information received in a holistic framework. The IGF strives in all of its work to provide a neutral and open platform which ensures that all interested parties in the multistakeholder Internet governance community can contribute in a bottom-up fashion.

This work recognises that increasing Internet access is a shared goal that is at the core of Internet governance, and many policy issues contribute to the enabling environment for improved access.

INTRODUCING *POLICY OPTIONS FOR CONNECTING AND ENABLING THE NEXT BILLION(S)*: PHASE II

In 2015, over 70 submissions contributed to the development of a set of *Policy Options for Connecting the Next Billion* – Phase I,[1] which was presented at IGF 2015 in João Pessoa, Brazil. Phase I mapped[2] the multifaceted nature of the challenge of increasing connectivity, and showed how stakeholders tend to approach the issue from diverse and unique perspectives (the outcomes of Phase I are described in more detail in Part A below). The process of developing Phase I also illustrated that when stakeholders share experiences to identify obstacles, solutions and strategies, innovative solutions and partnerships to multi-dimensional connectivity challenges may be encouraged and found (IGF, 2015).

The IGF's MAG decided in April 2016 to build upon and further develop *Policy Options for Connecting the Next Billion.* At the initial stages of this process, it was agreed to expand the scope and title of this initiative to better encompass some of the lessons learned in 2015, including the notion that access is not merely about technical access, but also extends to enabling and empowering users. It was further agreed to enable a broader interpretation of 'the next billion' to recognise the fact that there are more than 3.9 billion people still offline (c.f. Broadband Commission, 2016a). Because many of the unconnected are disproportionately poor, rural, elderly, female or disabled, the term should also be construed to include any persons who are not *meaningfully* connected to the Internet, in other words, users who are only barely connected (discussed in more detail in Part A below).

As a result, the initiative is henceforth referred to and known as the IGF *Policy Options for Connecting and Enabling the Next Billion(s)*, and the work done in 2016 is conducted under Phase II of this ongoing initiative.

Reading this paper

[1] The submissions can be viewed online: IGF (2015). *List of Contributors.* Available: http://intgovforum.org/multilingual/content/connecting-and-enabling-the-next-billion-phase-i [Accessed 22 September 2016].
[2] The outcome report can be viewed online: IGF (2015). *Outcome documents: Policy Options for Connecting the Next Billion*. Available: http://intgovforum.org/multilingual/content/connecting-and-enabling-the-next-billion-phase-i. [Accessed 22 September 2016].

Part A of this *Policy Options for Connecting and Enabling the Next Billion(s)* paper delves into the relationship between meaningful access and the UN Sustainable Development Goals (SDGs). It provides a brief summary of key lessons learned from Phase I of this initiative, as stakeholders' understanding of what 'meaningful access' is should build on the outcomes of Phase I, conducted in 2015. It investigates stakeholders' understanding, as gleaned from contributions to Phase II, of the barriers to access in order to ascertain how stakeholders can ensure that access is meaningful and thus able to not only connect, but to also *enable* the next billion(s). Having investigated stakeholders' understanding of meaningful access, the rest of Part A investigates both general and specific ways in which information and communication technologies (ICTs) and connectivity can support the SDGs.

Given that ICTs and the Internet are paramount to sustainable development, it is furthermore critical that policy options and strategies be tailored to local needs and specificities. In **Part B** of this paper, the focus therefore shifts to local and regional specificities that need to be taken into account when discussing and implementing *Policy Options for Connecting and Enabling the Next Billion(s).*

Lastly, in **Part C** of this paper, Phase II's conclusions and recommendations are summarised, along with proposed next steps for this initiative. [This section of Phase II will be addressing during a session at IGF 2016 in Guadalajara, Mexico, in December 2016, and updated following the conclusion of IGF 2016.]

Methodology: Phase II

Phase II of *Policy Options for Connecting and Enabling the Next Billion(s)* made use of the bottom-up, inclusive and multistakeholder-driven approach that defines the IGF and its intersessional processes. Its work was primarily driven by systematic rounds of online public consultations that facilitated the participation of a diverse selection of stakeholders in the work. All contributors' details are credited in the outcome document (see Appendix 1) and on the IGF's website[3], where the submissions are also published in full.

In Phase II's initial **planning stage**, the framework document (Appendix 2) that would form the basis of the activity's work was developed with the assistance of the multistakeholder community using

[3] The submissions can be viewed online: IGF (2016). *Connecting and Enabling the Next Billion(s) – Phase II* (Submissions tab). Available: http://intgovforum.org/multilingual/content/policy-options-for-connecting-and-enabling-the-next-billions-phase-ii. [Accessed 22 September 2016].

the IGF's mailing lists and discussions during a MAG virtual call. Ten (10) substantive written contributions were received from individual and MAG stakeholders.

Various individuals and MAG members also volunteered to assist the initiative in a more direct manner, and as a result an Editorial Working Group was formed. This Working Group was responsible for shaping the framework of the output document; for encouraging input; for helping to edit the document; and for assisting in the organisation of the presentation of Phase II's outcomes at IGF 2016 in Guadalajara, Mexico, in December 2016.

In the **first round of input,** a call for input (see Appendix 3) was issued to various mailing lists to elicit both background input on specifically the focus themes and responses to a comprehensive list of questions in the call for input. Targeted outreach to stakeholders working in fields relevant to the theme was also done at this time; and interested NRIs, DCs and BPFs were similarly encouraged to participate.

In the first round of input, initial contributions received following the call for input were analysed with the aim of identifying commonalities and differences across submissions. Common themes were extracted and summarised, as far as was reasonable and deemed relevant, in Draft I. Where relevant in the text below, the contributors are identified (for individual contributors, the country a contributor is from, is also listed). Draft I has further been augmented with relevant background contributions received from contributors and collected through a literature review of relevant publications recently published.

Draft I was published on the IGF's Review Platform on 1 November 2016, and remained open for public comment for a period of 21 days. Thereafter, it was closed and the comments received, along with other submissions received in the interim from stakeholders, were incorporated into Draft I in order to compile Draft II (this document). Draft II was published on the IGF's website before the annual IGF meeting in Guadalajara, where it will be further discussed.

In total, 58 written responses from 43 unique contributors were received in the first and second rounds of input; seven of which 11 were from National and/or Regional IGF Initiatives (NRIs). These include both background contributions (in the form of research or reports, for example), responses to all or some of the questions in the call for input (Appendix 3), and comments on the IGF review platform.

A third and final draft of this document will be published after the IGF and will reflect the contributions received during the IGF, as well as any other late contributions. [This section will be updated as the methodology progresses.]

Phase II objectives

The analysis provided in this paper aims to provide a reasonable and balanced reflection of submissions received with the objective of delivering a useful output that is reflective of general trends relevant to the challenge of connecting and enabling more Internet users.

For Phase II, the focus of this initiative was two-fold: to investigate how meaningful access supports the SDGs (Part A); as well as the local and regional specificities that need to be kept in mind when addressing connectivity concerns (Part B).

The overall objective of this paper is to drive stakeholder participation and collaboration around meaningful access and to demonstrate the value of the IGF as an inclusive, multistakeholder platform for engagement on complex challenges facing the development of the Internet and its governance in line with the IGF's mandate as prescribed by the Tunis Agenda for the Information Society (WSIS, 2005).

Phase II limitations

This paper builds on the foundations provided by Phase I of this initiative, which was concerned with promoting Internet access in general. As noted, Phase II addresses meaningful access; how connectivity can support the SDGs; and national and regional specificities that are important in connecting and enabling the next billion(s). Although many contributions received contain valuable content pertaining to connectivity in general, this paper is limited in scope to the content more specifically related to these topics.

This paper provides a synthesised analysis and summary of the contributions submitted by a variety of stakeholders in response to open calls for input and rounds of public consultation. The process

and related output is therefore primarily reflective of and contained to the input received from the multistakeholder community during this bottom-up and inclusive process.

Because this theme is highly dependent on and reflective of technological developments in fields pertaining to access infrastructure, this paper provides a snapshot relevant to a particular moment in time.

PART A

ACCESS AND THE SUSTAINABLE DEVELOPMENT GOALS

The SDGs

The SDGs were formally agreed upon by UN member states and the UN General Assembly on 25 September 2015 as part of the 2030 Agenda for Sustainable Development (UN General Assembly, 2015). This document sets out a global framework for development that not only builds on the eight Millennium Development Goals (MDGs) – which primarily focused on addressing poverty-related challenges in developing countries – but that are also far broader in that the SDGs address economic, social and environmental agendas across both developed and developing regions (c.f. GSMA, 2016b).

The 17 SDGs, which came into force on 1 January 2016, are not legally binding but create expectations for governments, with the assistance of other stakeholders (c.f. Cerf, 2016), to assume ownership and establish national frameworks for achieving these goals (UN, 2016):

> *Countries have the primary responsibility for follow-up and review of the progress made in implementing the Goals, which will require quality, accessible and timely data collection. Regional follow-up and review will be based on national-level analyses and contribute to follow-up and review at the global level.*

The Agenda for Sustainable Development specifically acknowledges the role of ICTs and the Internet as horizontal enabler for development, or cross-cutting 'means of implementation'. Paragraph 9-c. in particular sets an important goal relevant to the multistakeholder Internet governance community, namely to:

> *Significantly increase access to information and communications technology and strive to provide universal and affordable access to the Internet in least developed countries by 2020.*

Without meeting this goal, the Internet will be unable to meet its potential as a 'powerful tool' for sustainable development (ISOC, 2015). The Broadband Commission for Sustainable Development (Broadband Commission) points out that while ICTs and broadband can be a significant enabler to achieve progress in the SDGs, sufficient investment opportunities must be created for the universal deployment of broadband and their related services and application; along with 'a stronger

alignment and collaboration between existing initiatives' (Broadband Commission, 2016b). Ericsson, furthermore, takes the view that while the full potential of ICT for the SDGs is 'neither systematically nor adequately reflected' in the Agenda for Sustainable Development; the potential of unfolding innovations like the Internet of Things (IoT), advanced robotics, artificial intelligence (AI), and big data can offer substantial global gains for the SDGs (2016).

The Internet is crucial to the important transformation in the ways in which humans communicate with one another; leading to a world in which 'communication is quicker, information is more available, commerce more efficient and entertainment and education more easily accessible than ever before' (GSMA, 2016a). The World Bank also points out in its recent *World Development Report: Digital Dividends* that '[w]e find ourselves in the midst of the greatest information and communications revolution in human history' where the 'poorest households are more likely to have access to mobile phones than to toilets or clean water' (2016).

But – as was also noted in Phase I of this initiative – a vast proportion of the world's citizens remain unable to benefit from this transformation and the sustainable development potentially enabled by it, with traditional development challenges 'preventing the digital revolution from fulfilling its transformative potential' (World Bank, 2016). Before looking at both the generic and specific ways in which connectivity can support the SDGs, it is therefore important to investigate attempts and policy options to meet the SDG 9-c target in more detail.

Meeting the SDG 9-c. target of universal access

For universal access to support the SDGs, it needs to be both universal and meaningful. While there may be a growing number of initiatives at local, regional and global levels aimed at improving access levels, much needs to be done to ensure universal and meaningful access. The World Wide Web Foundation (Web Foundation), for instance, predicts that on current trends, the goal of universal access will only be reached in 2042 (n.d.). Statistics indicate that most offline populations are contained to a small number of countries, with China, India and Indonesia together accounting for 45% of the global offline population in 2013 (Broadband Commission, 2016a). Many of these offline populations also share similar barriers to access (c.f. World Bank, 2016) – as is addressed in more detail below.

Many of the 'next billion(s)' are either unable to benefit from Internet access at all, or are barely connected. As the Association for Progressive Communications (APC) notes (2016a):

> *…there is actually a spectrum of connectivity levels ranging from complete disconnection up to the fully connected on high bandwidth unlimited connections, with the majority of connected people somewhere in between.*

APC takes the view that the key to meaningful access is 'giving local people the skills and tools to solve their own connectivity challenges'. It argues that 'we need fewer 'satellite and balloon' projects, and more human development (2016b). The Web Foundation similarly notes that initiatives aimed at supporting SDG targets must 'build on the right foundations' to truly support sustainable development (n.d.).

What these 'right foundations' are, or the policy options for connecting and enabling the next billion(s), were discussed in Phase I of this initiative, and are briefly recapped below before delving deeper into stakeholders' understanding of what *meaningful* access entails and why it is so important for sustainable development.

Core lessons from Phase I: *Policy Options for Connecting the Next Billion*

The general and encompassing need for establishing **enabling environments** was highlighted by many stakeholders in Phase I; including the importance of creating environments inducive to investment through supportive policies, regulations, and legislation. Phase I also focused on developing a set of policy options aimed at fostering enabling environments, including deploying infrastructure; increasing usability; enabling users (e.g. through ICT literacy and training tools); and ensuring affordability.

In terms of **deploying infrastructure**, key findings from Phase I include that more investment in and partnerships to support infrastructure development is vital and a key driver for socio-economic growth and sustainable development. Priorities highlighted include the continued deployment of Internet Exchange Points (IXPs) to decrease costs and stimulate further development in local ecosystems (see the IGF BPF on IXPs for more information); along with the need to support the transition to Internet Protocol version 6 (IPv6) to ensure sustainable Internet expansion (see the IGF BPF on IPv6 for more information) . Another important dimension highlighted in Phase I was the

need to improve the use of universal service and access funds (USFs) for enabling Internet access through (regulatory) provisions for network expansion, the support of public access facilities (discussed in more detail below), and explicitly ensuring women and marginalised communities' access (among other things).

Phase I also emphasised the need to **increase usability** to ensure that people can actually benefit from Internet access. Contributors noted the importance of ensuring the availability of relevant content and applications that people can actually use, also in local languages and with content relevant to local contexts; emphasizing accessibility for people with disabilities; and ensuring that local media support the need for local content.

The need to increase usability is closely linked to the need to **enable users**, and was also highlighted in Phase I. Not only do people need to be able to retrieve, produce and distribute information over the Internet, but they need to do so in a way that protects and promotes their human rights online, enables them to become digital citizens in an inclusive manner, and expands and empowers them through user literacy efforts. The need for promoting and enabling the youth, people with disabilities, and the elderly was also stressed in this context.

Cost was identified as one of the most significant barriers to connecting the next billion Internet users by stakeholders, making the importance of **ensuring affordability** a key recommendation of Phase I. Contributions to Phase I highlighted the importance of more collaboration and targeted partnerships to bring down costs; along with the need for innovative policies and methods to bridge various digital divides.

Contributors also generally stressed the need for multistakeholder collaboration to address and achieve forward-looking connectivity goals. Access, contributors noted, should be universal, equitable, secure, affordable, of high quality, and supportive and reflective of human rights. For this reason, many contributors emphasised the need to support groups that may experience access challenges more profoundly or differently than others, including women, the youth, elderly people, disabled people, cultural minority groups, and various other minorities.

The compilation output document from Phase I was presented and discussed during a main session at IGF 2015 in João Pessoa, Brazil, on 11 November 2015. During the session, the compilation received broad approval from the IGF community and it was suggested that the document would not only be shared with relevant organizations and processes working on related issues; but that this intersessional activity would also continue in 2016.

Phase II: Enabling the next billion(s) by ensuring *meaningful* access

Besides connectivity, various contributors to Phase II point out that access does not automatically translate to adoption and/or developmental benefits – it also needs to be meaningful. The Broadband Commission, for instance, notes that meaningful Internet access requires 'relevant, affordable content, available in the right language and offering the capability to transform information into actionable knowledge' (2016a). In a recent report on how ICTs can accelerate action on the SDGs (addressed in more detail below), Jeffrey D. Sachs argues that while ICT is 'the most powerful new tool we have for solving the world's major challenges', technology 'by itself' is 'never a solution' (in Ericsson, 2016):

> *It must be properly deployed—directed towards social purposes—and extended to the poor and to remote regions that markets alone will not serve, at least not in a timely way. Put simply, technology must be combined with a will towards the common good. In our era, that means harnessing it to the global objectives embodied by the MDGs and SDGs.*

The World Bank takes the view that while access to digital technology and broadband may have expanded significantly, the broader developmental benefits from using these technologies (what the report terms 'digital dividends') have lagged behind (2016). It argues that digital dividends are not spreading fast enough for two reasons – the fact that almost 60% of the world's population are still offline and that there are 'persistent digital divides' in gender, geography, age, and income dimensions within and between countries. In respect of the latter, the Broadband Commission points out that the majority of offline populations are 'disproportionately poor, rural, old and female' (2016a). Before examining these digital divides and the barriers that prevent people from accessing and/or benefitting from access, the need for *meaningful* access is first investigated.

Towards meaningful access

APC takes the view that ICTs remain constrained from supporting sustainable development due to inequalities in current access levels. It stresses that there is a risk that those who do not have access at all, or are only 'barely connected' may be 'doubly excluded' from the potential benefits that

connectivity could offer for their sustainable development. As such, many are at risk of being (2016b):

> *…excluded from the "new" world of information and communications that the internet delivers, and also excluded from the "old" analogue world they used to have access to – even if imperfectly – because so many of those services and opportunities are increasingly only available online.*

Phase II of this initiative therefore encourages stakeholders to not only focus on connecting the next billion(s) Internet users, but also on *enabling* them and the barely connected through *meaningful* and pervasive access to the Internet (c.f. APC, 2016b).

The Diplo Foundation argues in its original contribution to CENB Phase II that connecting and enabling users requires a multi-layered approach that enables both technical and human development in a manner that supports 'core human and societal aims' (2016). Various other contributors similarly note that meaningful access is a challenge that transcends the issue of infrastructure, and requires investments in the development of human capabilities and what the World Bank terms analogue (or 'analog') complements (2016):

> *For digital technologies to benefit everyone everywhere requires closing the remaining digital divide, especially in internet access. But greater digital adoption will not be enough. To get the most out of the digital revolution, countries also need to work on the "analog complements"—by strengthening regulations that ensure competition among businesses, by adapting workers' skills to the demands of the new economy, and by ensuring that institutions are accountable.*

Contributors to Phase II respectively stress that meaningful access requires ensuring that people, for example:

- **are able to use services to benefit from access – whether they are in rural or urban areas** (Zimbabwe IGF, 2016);
- **can both consume and produce content**, i.e. that they:
    - 'have the skills to meaningfully engage online and critically understand the content they consume – as well as empower them with skills for them to create content' (Oghia, Serbia, 2016a);
    - can 'take part fully in the global and local information society' by having not only the capability to consume and interpret various media types from a wide array of sources,

but also the tools and skills to produce content themselves' (DC for Public Access in Libraries, 2016);

  - have 'the necessary abilities to generate, process and/or share information' that foster the economic and social development (Federal Telecommunications Institute, Mexico, 2016).

- **can take part in processes aimed at ensuring meaningful access**, i.e. that they:

  - are more aware of Internet governance processes and the relevance of such processes to them (Rayamajhi, Nepal, 2016);

  - are engaged in the 'definition of priorities, design, development and implementation; of policies and programmes aimed at sustainably addressing meaningful access' (Hendi, Canada, 2016).

- **are able to become and benefit from being responsible consumers**, i.e. that they:

  - are provided the 'right product and services' to meet their specific needs as users (Ogero Telecom, Lebanon, 2016);

  - are able to 'assume responsibility' for their online activities, which includes the ability to realise the importance of media literacy training, informed consent, the capacity to participate fully online, and understanding that human rights apply equally online and offline (EuroDIG, 2016).

To ensure that meaningful access also serves the SDGs, enabling all users to benefit from the economic and social benefit associated with a 'full and pervasive affordable connectivity environment' (APC, 2016a) is necessary. APC stresses the need for pragmatic and objective policies and strategies to be 'efficiently and rapidly implemented' through 'extensive public consultation that includes all stakeholder groups'; along with measurable targets by which to judge and ensure their effectiveness (2016b).

The Diplo Foundation also reinforces the importance of 'ongoing capacity development' to support related policy development; which includes the need for 'continual access to expertise and sharing of best practices' (2016). These policies should target not only the supply-side barriers, but also

demand-side barriers through relevant support for training programmes (c.f. 1 World Connected, 2016).

Facebook emphasises the fact that there is no 'one-size-fits-all solution' to overcoming barriers and meeting connectivity goals, and that a range of different approaches are needed depending on 2016).

Bridging various digital divides

Contributors to Phase II note that some of the barriers or limitations not only restricting access in general but also preventing people who do have some level of Internet access from being enabled or empowered through such connectivity include:[4]

- the **quality** and speed of **such** access;
- the relative (in)**affordability** of broadband and devices;
- insufficient **knowledge** or **awareness** regarding the potential relevance of the Internet;
- a lack of **digital literacy**;
- the perceived irrelevance of **content** and services available online, including a lack of localised content and services in local **languages**;
- fears of **surveillance** and the absence of **trust** in accessing services on ICTs;
- security **threats** faced online and enabled by ICT-use, including threats of online abuse and gender-based violence; and
- the legal and **regulatory frameworks** concerned (including the level of **support** given in developing connectivity policies and programmes).

While most of these barriers were evaluated in detail in Phase I (2015) of this initiative, a few additional comments pertaining to how these barriers interact should be highlighted. APC, for

[4] Summarised from barriers cited by contributors, including: 1 World Connected, 2016; UNHCR, 2016; Facebook, 2016; Namanga, Cameroon, 2016; Diplo Foundation, 2016; GSMA, 2016a; Oghia, Serbia, 2016; APC, 2016a; Rayamajhi, Nepal, 2016; Zimbabwe IGF, 2016; Ogero Telecom, Lebanon, 2016; the Federal Telecommunications Institute, Mexico, 2016; VimpelCom, 2016; Lima, Brazil, 2016; public comment responses received by APrIGF, 2016b; Central Africa IGF, 2016; Zazai, Afghanistan, 2016; Hendi, Canada, 2016.

instance, points out that high costs and other barriers create 'a strong chilling effect on usage' (2016a); particularly because many of these barriers are inextricably linked and/or closely related.

GSMA, for example, notes that an increase in locally relevant content by itself will not lead to more meaningful engagement if people do not have the skills to access and use such content (2016a). GSMA also suggests that content availability and relevance roughly correlate with a country's economic status. Developing countries, particularly in the Middle East and North Africa, Asia Pacific and Sub-Saharan Africa, are more likely to 'suffer from a lack of locally relevant content relative to their more economically developed peers' (GSMA, 2016a). (The ways in which barriers affect specific regions are discussed in more detail in Part B of this paper.)

Access inequalities and barriers like content availability not only affect those in developing countries more profoundly, but also those in rural areas, cultural minorities, women, refugees, and disadvantaged groups. The World Bank notes that there are still 'persistent digital divides across gender, geography, age, and income dimensions within each country' (2016). GSMA similarly points out that social norms and disparities in terms of levels of education and income compound other barriers to meaningful access, leading to significant digital divides (2016a). APC argues that social inequalities have to be taken into account when addressing connectivity challenges (2016b):

> *…those with the least connectivity are by and large also those who are most excluded economically, socially and politically. Their lack of access is first and foremost a result of this exclusion and while the internet may present opportunities for some social advancement, it will not alter the structural social and economic processes that causes inequality and exclusion in the first place.*

The need to specifically consider the barriers **women** face in gaining access was stressed by various contributors (e.g. GSMA, 2015a). The IGF's BPF on Gender and Access 2016 points out that women are less likely and/or able to benefit from access to the Internet than men, particularly in developing countries (2016). Recent statistics from the International Telecommunication Union (ITU) indicate that men are more likely to have access to the Internet in all regions of the world, with the global Internet user gender gap actually growing from 11% in 2013 to 12.2% in 2016 (2016a). This tendency is evident in developing countries but less so in developed countries, where access inequalities improved from 5.8% in 2013 to 2.8%. At 23%, the access gap is the largest in Africa and the smallest in the Americas (2%). In Least Developed Countries (LDCs), furthermore, only approximately one in seven people will be online by the end of 2016 –and only 31% of them will be women (Broadband Commission, 2016:46).

GSMA notes that gaps such as the gender digital divide, for instance, are 'driven by a complex set of socio-economic and cultural barriers' demanding 'targeted intervention'. GSMA takes the view that when women have access to the Internet through, for instance, mobile phones, 'there are significant benefits not only for women themselves, but for their communities and the broader economy as well (2015a). The reasons for these discrepancies, along with initiatives that help to overcome these barriers to access, are also investigated in more detail in the IGF BPF on Gender and Access 2016.

The need for targeted action to address access inequalities for women is also important in addressing access gaps in general. As the Alliance for Affordable Internet (A4AI) argues (2016a):

> *We cannot achieve universal access without bringing women (half the world's population) online; likewise, women's empowerment through ICTs will not happen without enabling women affordable access to the Internet.*

Targeted initiatives may furthermore be required to address the connectivity of **refugees**. Recent findings by the UN High Commission for Refugees (UNHCR) indicate that refugees are 50% less likely to have access to an Internet-enabled device and more than twice as likely to have no phone at all. Such a lack of connectivity, the report points out, affects refugees' ability to access basic services and information, to communicate with loved ones, to seek and maintain employment, and to 'ultimately empower themselves' (2016:10-11):

> *For many, connectivity has become as critical for survival as food, water, and shelter. Without it, families often cannot make safe passage, receive protection, or ensure that their loved ones are alive.*

The UNHCR notes that digital technology can serve as a 'critical enabler' of the new solutions needed to address the current and protracted refugee crisis. Increased connectivity can help refugees to become more self-reliant by empowering them to organise themselves and share information among refugee communities; can help them to better position themselves and advocate more effectively through advanced access to relevant information; and can allow them to engage more meaningfully in all aspects of programmes that affect them (2016):

> *A connected refugee population would unleash innovation in areas such as communicating with displaced persons, responding to their security needs, and getting humanitarian services to them. Connectivity will improve lives and transform humanitarian operations.*

Are all means of gaining access meaningful?

Some contributors to Phase II note the need to differentiate between mobile (or private, individual subscription-based) access and access using public access facilities when universal access goals are concerned. While public access facilities are vital for those who can afford neither their own devices nor data, it can also act as an important supplement to 'private' access.

APC argues that while support for the provision of public access facilities is waning in some countries due to the growth in mobile access, as well as views 'that public access is just a stepping stone to private access', public access remains vital. One reason is the fact that many of those restricted to mobile services face low speeds and capped traffic, which by itself could limit connectivity's potential to support sustainable development. As APC notes with regards to public access facilities as a complementary service for sustainable development (2016b; 2015a):

> *Large-format screens and high definition multimedia provide a more immersive learning, professional or entertainment experience, but may be too slow or costly via a mobile connection.*

1 World Connect notes in its submission that there are regions where public access facilities or community anchor institutions such as schools and libraries are more effective mechanisms for providing meaningful access for a few reasons that have been illustrated through their research, including the fact that such facilities often provide access to free training programmes, which develops skills for users to utilise such programmes; it is often easier for social responsibility initiatives to collaborate with public access facilities as opposed to setting up their own digital literacy training programmes; and such facilities also provide an environment where peer networks can be formed and learning can be enhanced through group activities, which often improves uptake (2016).

In its most recent annual *Affordability Report*, A4AI similarly notes that devices and access remain unaffordable to vast segments of the population. For this reason, they propose (among other things) increased investment in and availability of public, subsidised access for groups for whom access costs remain prohibitive, or groups that are otherwise excluded (e.g. women), in order to reach the SDG target of universal access. A4AI also takes the view that public access can help to support other SDGs (2016a:40):

> *Public access facilities offer broadband-enabled services, but they also double up as entities that provide educational opportunities, digital literacy training and, in many cases, skill development and distance learning opportunities.*

For this reason, A4AI proposes that policymakers should work to strengthen local knowledge on how to create 'sustainable public access venues' that offer 'locally relevant content and services such as e-government services, and that could be funded through USFs (2016a).

The IGF Dynamic Coalition (DC) on Community Connectivity takes the view that because almost 60% of the world's population live in rural areas or urban slums, novel approaches must be adopted if the Internet is to reach everyone (2016a). One example of such an approach, suggested by the DC and other contributors (e.g. Jensen, 2016), is community networks (CNs), which are structured to be open, free, and neutral and rely on the active participation of local communities in the design, development, deployment and management of the shared infrastructure as a common resource, owned by the community, and operated in a democratic manner. CNs can be operationalised, wholly or partly, through local stakeholders, NGOs, private sector entities and/or public administrations; and are characterised by collective ownership; social management; open design and open participation; free peering and transit with networks offering reciprocity; as well as the promotion of free software and open standards and technologies (2016a; 2016b).

The DC on Community Connectivity points out that in the past ten years, a variety of successful examples of CNs have emerged on all continents, exploiting many technical and governance configurations. Such examples (investigated in more detail in 2016a, the DC on Community Connectivity's annual report) have demonstrated that CNs may proffer a viable option to connect the unconnected while empowering local communities and building local technical capacities. Notably, the establishment of CNs has proven that local stakeholders, including public administrations, entrepreneurs and NGOs, may become important protagonists for the development of Internet connectivity; building infrastructure and proposing innovative sustainability models. Furthermore, CNs foster the development of new services, applications, and local content as well as job creation; as is illustrated in the Guifi.net and DEF India cases (see the DC on Community Connectivity's annual report for more detail).

Examples of successful community connectivity initiatives can also be found in the submission of the Colombian National IGF Initiative, which notes that community-owned CNs can contribute to the creation of resilient infrastructure that can be maintained by the community in underserved rural areas in Colombia (2016). 1 World Connected similarly highlights the efforts of Rhizomatica to

provide communities with technical and legal support to help deploy user-owned and operated networks through open-source technologies. Rhizomatica uses existing community organizing structures in rural Mexico to create more sustainable models where communities are personally involved and trained in the maintenance and deployment of networks, while Rhizomatica retains only a supporting and training role. Rhizomatica serves sixteen rural communities of 2,500 or fewer inhabitants today, providing the first Internet access to these communities. This connectivity helps to facilitate mobile and Internet services for banking and healthcare, communication in case of emergencies home delivery services, and community-wide messaging by local leaders (1 World Connected, 2016).

CNs are therefore particularly useful in empowering communities and local entrepreneurs to solve their own connectivity challenges in a sustainable manner (DC on Community Connectivity, 2016a). At the African IGF, for instance, one of the conclusions were that the creation of CNs should be supported to not only connect communities to the Internet, but to also help enable the provision of other relevant infrastructure, like phone charging stations in a community (2016).

The DC on Community Connectivity argues that public policies should be crafted in order to facilitate the establishment of CNs, as suggested by its Declaration on Community Connectivity. It argues that 'CNs are an example of connectivity for local communities by local communities through the community and relevant stakeholders' (2016a). CNs can therefore help to empower communities and local entrepreneurs to solve their own connectivity challenges in a sustainable manner (DC on Community Connectivity, 2016b):

> *Bottom-up strategies that embrace non-discriminatory treatment of Internet traffic and diversity in the first square mile can truly empower individuals and communities, allowing everyone to play an active role in making connectivity affordable and easily accessible.*

Similar to the rationale for CNs, the APrIGF also takes the view that 'frugal innovation' – or low-cost solutions that originate from local communities, use local knowledge and resources, and meet specific local needs – must be included in national development agendas as they tend to fulfil needs neglected by mainstream businesses (2016a):

> *While scientists, technologists, innovators and entrepreneurs are considered the traditional sources of innovative activity, there is potentially untapped resource of talent residing in under-represented communities, including women.*

How Internet connectivity can generally support the SDGs

The potential impact of broadband access on the SDGs has been noted by a number of organizations. APC, for instance, argues that 'affordable and reliable internet access has become a vital means to exercise fundamental human rights and to support economic, social and human development' (2016b). UNESCO, similarly, affirms in its outcome document from the *Connecting the Dots: Options for Future Action* conference that ICTs' ability to increase access to information and knowledge also 'supports sustainable development and improves people's lives' (2015). In its recent *The State of Broadband Report* (2016), the Broadband Commission also notes that broadband 'can play a vital role in achieving the SDGs' and 'underpinning inclusive and sustainable development'. It notes (2016a):

> *A large body of economic evidence has amassed for the role of affordable and effective broadband connectivity as a vital enabler of economic growth, social inclusion and environmental protection.*

Individual and other stakeholders contributing to Phase II similarly note that connecting and enabling users with meaningful Internet access, along with associated reduced communication costs and improved access to information/knowledge, can support all of the SDGs to some extent (e.g. Saldanha, 2016; World Bank, 2016). Anthony Namanga argues in his contribution to Phase II that the Internet 'cuts across all the different SDGs, starting from Goal 1 to Goal 17' (Cameroon, 2016). Other contributors note that the Internet and ICTs have the potential to act as cross-cutting enablers for sustainable development (e.g. Federal Telecommunications Institute, Mexico, 2016) or as providers of 'new ways of sharing and analysing information' (ISOC, 2016b). Kim Lilianne Henri takes the view that ICTs are multidimensional and dynamic and can thus simultaneously impact and involve structures and processes on diverse levels of government, in numerous sectors, and on various stakeholders and partnerships (Canada, 2016). Ericsson, in turn, argues that every goal can be positively impacted by ICTs as 'the essential infrastructure platform for the SDGs' (2016):

> *…the digital revolution currently under-way is paving the way for an Age of Sustainable Development—a profound transformation of society where technology is a key contributor to human and planetary wellbeing.*

The Broadband Commission explains that there are macroeconomic, microeconomic and individual empowerment arguments to be made for the capacity of broadband to support development. The ICT sector itself can contribute to the gross domestic product (GDP) of countries, can stimulate

innovation, and can improve access to new markets. Microeconomic arguments tend to focus on productivity gains at firm levels, including through more efficient working methods, the automation of some tasks, and reduced production costs. The importance of individual empowerment is also stressed by a number of Phase II contributors, although – as the Broadband Commission points out – 'many studies focus on the potential of ICTs, rather than actual impact' (2016a).

Various recent reports have listed ways in which ICTs may impact the SDGs. NetHope, for instance, takes the view that ICTs can support the SDGs by enhancing stakeholders' capacity to measure and evaluate progress toward all of the SDGs; providing opportunities for streamlining and enhancing the efficiency and effectiveness of all activities in the development landscape; and providing access to a new range of digitally enabled products and services to strengthen local economies, local innovation and local communities (2016). In its recent report on how specifically the mobile industry's core business can support the SDGs, GSMA argues that the mobile industry, more specifically, can play a crucial role in supporting or impacting almost half of the 169 supporting targets of the SDGs by helping to include more people by scaling networks and access; by innovating in order to create new ways to enhance quality and ease of access; and by influencing policies and partnerships to contribute to sustainable development (2016b).

Ericsson similarly notes that ICTs can speed up and increase the rate of diffusion of relevant services, 'helping low-income countries to leapfrog to achieve key development milestones while contributing to a growth economy'. It lists five ways in which ICTs can support the SDGs when combined with innovative policies, series and solutions, namely by:

- upscaling critical services in health, education, financial services, smart agriculture, and low-carbon energy systems;
- reducing deployment costs in addressing urban and rural realities;
- enhancing public awareness and engagement;
- supporting innovation, productivity, and efficiency; and
- upgrading the quality of services and jobs more quickly.

The ways in which connecting and enabling the next billion(s) supports the SDGs in a cross-cutting manner therefore include the Internet's ability to expand the information, reduce communication and information costs and enable increased knowledge and information sharing (e.g. UNESCO, 2015; World Bank, 2016; UNHCR, 2016). Ogero Telecom points out that the Internet provides a 'vital platform for the growth of ICT and for the emerging knowledge economy in which information is

crucial to create new and improved products and services' (Lebanon, 2016). GSMA similarly argues that the Internet is a 'game changer for development' in that it facilitates a 'dramatic increase in the amount of information available to the average global citizen'; leading to more opportunities for collaboration and productive interaction among stakeholders that support the development of sustainable economies and societies (2016a). In its submission, the Central Africa IGF, which gathered input from Cameroon, Chad, Congo Brazzaville, and the Democratic Republic of Congo, also emphasises the importance of information-sharing and access (2016).

Contributors listed various ways in which connectivity can bolster knowledge societies and impact sustainable and inclusive development more broadly, including, for instance, the ability to more swiftly respond to disasters and emergencies; to engage the youth in development processes; to support better decision-making and evidence-based public action; and to aid overall accountability and transparency efforts (discussed in more detail below). As the Internet Society (ISOC) notes (2015):

> *Of course the Internet is not 'the answer' to the challenges of poverty, inequality and environmental degradation. But it offers new ways of sharing and analysing information - new tools for delivering on the Sustainable Development Goals.*

Ensuring Internet access actually supports the SDGs

While technology and connectivity therefore have the potential to support the SDGs, various contributors note that achieving this potential will depend on the **quality, level and nature** of connectivity; including whether or not access is ***meaningful*** (also addressed above). Mexico's Federal Telecommunications Institute explains in its contribution that progress will 'depend on reliable, robust, available, safe and trustworthy infrastructure and communications services' (2016). The Central Africa IGF furthermore stresses the need for raising awareness among the **youth** and vulnerable communities pertaining to the SDGs (2016). Facebook also notes the importance of global **partnerships** and coordination – including government, industry, civil society, and local communities – to expand access (2016).

A holistic understanding of **local contexts** is also vital to ensuring that access and ICTs do support connectivity goals – as is illustrated from an example submitted by the Zimbabwe IGF to Phase II, and is further investigated in Part B of this paper. A project in rural Tanzania in 2012, which aimed to

encourage citizens to pressurise local authorities to maintain and repair broken water pumps by using text or short message services (SMS), was unsuccessful. The Zimbabwe IGF notes that the initiative's failure can be attributed to a variety of reasons, including the fact that citizens were reluctant to report on their government in local communities; water collection in the communities concerned is generally the responsibility of women and children who often do not have access to Internet-enabled devices; and a lack of reliable electricity supply and limited mobile network coverage also hampered citizens from consistently using the service (Zimbabwe IGF, 2016).

In addition to the need to take local contexts and analogue complements into consideration, there are also **risks** involved in using ICTs to support the SDGs. Ericsson, for instance, notes fears regarding increased risks to privacy and of surveillance; cybersecurity; the loss of relevant human skills' possible public concern about health effects; electronic waste and carbon emissions; digital exclusion; and child protection online (Ericsson, 2016). GSMA similarly warns that the (mobile) industry will have to learn to manage like privacy and data concerns, e-waste, and the increasing energy requirements driven partly by the growth and demand for mobile data.

Lastly, contributors also argue that more **research** is needed to understand connectivity challenges if the SDGs are to be served. 1 World Connected – a research project based at the University of Pennsylvania's Centre for Technology, Innovation and Competition to catalogue, analyse and disseminate information about innovative approaches to connect more users – argues in its submission for 'a data-driven approach to develop a nuanced understanding of both demand- and supply-side drivers' of broadband Internet adoption (2016). (This project also submitted some useful case studies of initiatives that are helping to overcome various barriers to access (2016). Where possible, these examples are worked into the text below, but more information about these initiatives can be found online.)

Kim Lilianne Henri similarly points out that 'the lack or limitation of journaling of experiences, stories and *processes* in using ICTs to support development is a challenge, as well as an opportunity for future consideration' (original emphasis, Canada, 2016). The need for more research, particularly in certain regions, was also emphasized in public comment responses received by the APrIGF in its targeted effort to gather input for Phase II, which is further discussed in Part B below.

Access and the specific SDGs

While most contributors highlight the Internet's potential to support the SDGs more broadly, some also identified particular SDGs that meaningful access can support, and/or the ways in which certain SDGs, like Goal 9c mentioned above, can act as building blocks for other SDGs (Saldanha, 2016). SDGs for infrastructure, gender equality and education, furthermore, contain specific ICT targets.

The ways in which specific SDGs can be supported through connecting and enabling more users is addressed in more detail in this section. For some of the 17 SDGs, there is a more direct connection between the goal and connectivity than for others, as is reflected by the amount of content and examples submitted by stakeholders for each SDG. A summary of these contributions is provided below.

It should be noted that the role of ICTs in supporting a specific SDG is often inextricably intertwined with other SDGs. Ericsson, for instance, points out that financial inclusion through ICTs will not only help to reduce poverty (SDG 1) through employment and other income-generating opportunities (SDG 8), but also through supporting small and medium enterprises (SDG 9). Higher income allows families to invest in education (SDG 4) and health (SDG 3), and offers access to improved nutrition and food security (SDG 2). The availability of credit, savings and insurance, for instance, can help to promote sustainable agriculture (SDG 15), and to provide more security during national disasters, financial crises or other challenges (see SDG 10 below).

No poverty (SDG 1)[5]

Summary of targets: End poverty in all its forms everywhere

Contributors note that connecting and enabling users can help to alleviate poverty by, among other things, increasing productivity, bolstering transparency measures, promoting competitiveness, enabling access to new markets, giving people access to financial services through mobile and other devices, and ensuring the protection of consumers (through fair pricing, transparency, and faster payments, for example). Meaningful access can also support entrepreneurs in expanding their business, for example through m-platforms, which can also be valuable platforms for providing financial services to the poor.

[5] Note that for ease of interpretation, the summary headings used by the UN for the SDGs have also been adopted in this paper.

Meaningful Internet access furthermore helps to reduce poverty by increasing people's opportunities for gaining employment (addressed in more detail under SDG 8 below). The IGF's DC for Public Access in Libraries, for instance, notes that in Slovenia, the Ljubljana City Library hosts an employment information service that helps many homeless and other people develop their CVs and find work (2016). A study by John B. Horrigan for Comcast, which focused on low-income Internet users, has similarly found that the majority of Internet users in their study use the Internet to look and apply for a job, as well as to acquire new skills, gain training on how to start their own business, and to take classes online, for instance (2015).

GSMA takes the view that the mobile industry has a significant role to play in alleviating poverty by supporting economic growth; with the World Bank having found that a 10% increase in mobile penetration is associated with a 1.35% increase in the GDP of developing countries. The mobile industry can support the goal of alleviating poverty by expanding knowledge of the economy, facilitating information exchange, and driving productivity and innovation, for instance. These effects also have wider social application; affecting educational outcomes (SDG 4) and improving health (SDG 3) (GSMA, 2016b), for instance.

Zero hunger (SDG 2)

Summary of targets: End hunger, achieve food security and improved nutrition and promote sustainable agriculture

Contributions reinforce the notion that the promotion of sustainable agriculture is closely tied to ending hunger, achieving food security and supporting improved nutrition. Internet access can support people in the farming and fishing industries to apply for agricultural subsidies, to find information about new crops and innovative techniques, and to thereby improve productivity, to receive and find updates about real-time climate and other conditions, to gain access to new markets, and to learn more about market needs and demands. As ISOC notes in a background contribution (2015):

> *Access to information is critical to farmers everywhere. The opportunity to seek advice from experts and share experience with other farmers can mean the difference between success and failure, especially for those working on marginal land.*

In Uganda, for instance, community libraries use computers and Wi-Fi connection to the Internet to train farmers and community members to use technology and access information on new crops and farming methods, while in Romania, public library staff have worked with local government to help farmers use new ICT services to apply for agricultural subsidies (DC for Public Access in Libraries, 2016).

In Papua New Guinea, for instance, connectivity provided by the Rural Communications Project has enabled rural farmers to gather information on supplies and prices in the cities in ways they could not do before. As 1 World Connected notes (2016):

> *The benefits of rural connectivity are felt acutely in villages like Kore, which previously had no access to any form of telecommunications services. Initially, villagers had to climb up a hill to receive weak mobile signals from a cell phone tower in Hula 25 kilometers away. The establishment of a base station in Kore allows farmers to order seeds and fertilizers using a cell phone instead of spending the extended time needed to travel to Port Moresby. Women entrepreneurs have started selling prepaid top-up cards to the villagers and set up solar-based charging stations for mobile phones. Access to services enhances economic opportunities for these communities.*

Many contributors also point out that meaningful access is important in emergency or crisis situations, helping people to communicate and coordinate better to meet food and other needs, to enable quick and simple donations, and to support particularly needy areas. Shreedeep Rayamajhi points out that the Internet is useful in times of crisis to promote safety and enable better management of resources. During the 2015 earthquake in Nepal, for instance, Shreedeep could collaborate with various people through the social media platform Facebook to communicate and match particular needs with available resources in a more consistent and efficient manner (Nepal, 2016). 1 World Connected also notes that mobile phone services provided through the Rural Communications Project in Papua New Guinea, for instance, allows people in unconnected areas to reach medical assistance faster; thus helping to save lives (2016).

Good health (SDG 3)

Summary of targets: Ensure healthy lives and promote well-being for all at all ages

Meaningful access can help sustain healthy lives and promote well-being at all ages by reducing costs (e.g. through disease surveillance and preventative campaigns); improving the quality of data, thereby helping to fight diseases by enabling medical service delivery and collaboration in health systems; training health professionals; and by generally improving efficiency and accountability (among other things) (e.g. Ericsson, 2016). The DC for Public Access in Libraries, for instance, points out that in Botswana, 87% of library visitors noted that their health improved as a result of health information they found using public library services (2016).

Contributors note that Internet access also enables the establishment of unified and better managed databases, including new abilities to integrate diverse parts of health services; better health reporting and early health warning detection systems; advanced systems of drug registration and control; inoculation and vaccination registration systems; hospital management systems; and the maintenance of possible national electronic health records (e.g. Albania, 2016; Zimbabwe IGF, 2016).

Besides supporting an array of information systems, contributors point out that Internet access helps to empower people by enabling access to information on healthy choices and lifestyles (e.g. UNHCR, 2016). ISOC notes that especially in developing countries with a shortage of health workers, the Internet is a 'vital resource' for information and 'support to hard-pressed clinicians'. One estimate, ISOC points out, suggests that up to 59% of patients in emerging markets make use of mobile health services (2015). Facebook furthermore notes that in Colombia, for instance, the digital platform 1doc3 helps doctors answer medical questions and has even enabled better engagement with the Colombian government on health matters (2016):

> *When 1doc3 noticed questions submitted regarding "condom water" from remote areas of Colombia, they investigated and found out that people in certain remote areas believe that boiling a condom and drinking the water helps prevent pregnancy. Taking that information back to the government, the service collaborated with the government on an education campaign targeted to remote areas where people believed in the practice.*

For people in remote and/or rural areas, Internet access is also particularly useful for finding important health information; while connectivity also helps hospitals in such areas to be better linked with hospitals in urban areas. Ogero Telecom explains that an initiative in Lebanon, Telemedicine, links major hospitals in Beirut and abroad with hospitals in rural areas; enabling real-time video consultation between doctors and enabling the sharing of data and diagnostics from afar (2016).

In India, a similar initiative that forms a part of Wireless for Communities (W4CC), run by the Digital Empowerment Foundation and ISOC, provides telemedicine services at local public health centres. The project has provided internet connectivity that enables health care centres in rural Jharkhand and Tripura to provide telemedicine services and receive expert advice from doctors through Skype calls (1 World Connected, 2016).

Contributors also note that access helps to support health systems that promote cardiovascular health through proper monitoring (e.g. Arthur Zang's Cardio Pad; cited in Namanga, Cameroon, 2016); the combatting of diseases like tuberculosis (e.g. in Kyrgyzstan; cited in DC for Public Access in Libraries, 2016); and the more accurate reporting of births using mobiles (e.g. the Uganda Mobile VRS, cited in GSMA, 2016a).

Access is also proving important in the promotion of maternal health and safety. In Myanmar, for instance, a maternal healthcare application provides advice to expectant parents; while in Uganda an affordable smartphone-based ultrasound helps to reduce neonatal and maternal mortality rates by enabling doctors and midwives to better monitor the health of foetuses and expectant mothers (GSMA, 2016a). In Nepal, furthermore, an application provides particularly low-income expectant mothers with relevant information to promote maternal health (Rayamajhi, Nepal, 2016).

Quality education (SDG 4)

Summary of targets: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all

Education and development of human capital – as a crucial investment in long-term economic development – remains an important challenge around the world. In various developing areas, a lack of basic infrastructure, conflict, and other challenges like adolescent pregnancy and child marriage hamper enrolment and completion rates. Barriers to education affect women more profoundly, with two-thirds of the world's illiterate adults being female (GSMA, 2016a). Yet, as various stakeholders point out, ICTs offers the potential for acceleration in helping to overcome these and other challenges (Ericsson, 2016; GSMA, 2016b).

> *ICT's accelerator role is a powerful mechanism in every aspect of education: teacher training, local curricula, local-language instruction, monitoring and assessment of student performance, education-systems management, coaching and mentoring, and preparing students for a world*

in which ICT is a necessity for successfully navigating their future careers and lives and contributing to their national economies.

Various other contributions also indicate that connecting and enabling users can help to ensure inclusive and equitable, quality education by (among other things) letting educational content be shared with larger audiences at lower costs, connecting classrooms, supporting teacher training, improving access to learning and teaching resources in both urban and rural areas, and by making content more relevant and responsive to learners' needs (c.f. ISOC, 2015). In Lebanon, for instance, there are plans to configure all schools with wireless Internet access and to provide access to devices in classrooms. As Ogero Telecom notes in its contribution to Phase II (Lebanon, 2016):

Mobility, broadband and the cloud are key technologies that place connectivity at the forefront of change to enable users and to transform education and deliver quality schooling in the digital age.

The UNHCR points out that connectivity is furthermore crucial in enabling refugees to participate in online training courses and to access education remotely – including refugee children at primary or secondary school level who can have the opportunity, facilitated by Internet access, to continue their disrupted education in their primary language (2016):

Without connectivity, millions of displaced children won't get the education necessary to become the doctors, teachers and future leaders of their communities.

Access also enables teachers to develop professionally, to share their knowledge, and to better meet their students' needs. The BridgeIT programme, for instance, shares educational content and enables teacher training using smartphones (GSMA, 2016b). ICTs and access can furthermore support education systems by aiding logistical and financial management and enabling better networking between schools, private and public institutions, and interaction with relevant government departments of education.

Despite the many potential benefits that connectivity can have for education, there are still few schools that have Internet access. ISOC, for instance, notes that there are fewer than 25% schools with Internet access in some developing countries (2015). In her contribution, Kim Lilianne Henri furthermore takes the view that national education programmes in Latin America, for instance, tend to consider technological 'tools' as additional or 'external' to curricula, and by doing so miss out on the potential of using ICTs better to enhance existing curricula and to promote the formulation of 'integrative and complex perspectives' that can help to narrow digital divides (Canada, 2016).

Gender equality (SDG 5)

Summary of targets: Achieve gender equality and empower all women and girls

Promoting gender equality and empowering women and girls in line with SDG 5 requires not only that unequal access to infrastructure be addressed, but also that the costs of devices and connectivity be decreased, as affordability affects women more significantly than men. It also requires addressing gender disparities in education opportunities, including digital literacy; investing in the creation of content relevant and useful to women; and tackling gender-based harassment and abuse, both in physical spaces for accessing the Internet (such as public access facilities) and in online environments (including various forms of online harassment) (IGF BPF on Online Abuse and Gender-Based Violence, 2015).

Contributors point out that the promotion of gender equality can be supported through Internet access by enabling women's independence, social participation and autonomy; by ensuring that more information is shared about gender equality and human rights; and by enabling better access to information (including potentially sensitive information, like information related to sexual and reproductive health).

Women's empowerment and gender equality are furthermore served, for example, through the support of female farmers and entrepreneurs. As GSMA points out, access to a smartphone in Kenya gives women the same opportunities as men in extending business contacts, increasing working hours and improving income (GSMA, 2016a). In India, for instance, the W4C initiative is providing ICT training, certification and diploma courses on computer concepts and tele-health technology courses at Chanderiyaan, in Central India. As a result of wireless Internet and broadband, the weavers of Chanderiyaan are using e-commerce and Facebook to sell their crafts. Another initiative of W4C, the Wireless Women for Entrepreneurship & Empowerment, identifies women from self-help groups within communities and provides them with targeted training. The training helps to empower these women, who come from varied backgrounds, to become entrepreneurs by giving them the skills needed to set up and maintain websites for their services and goods (1 World Connected, 2016). (See the IGF BPF Gender and Access 2016 for more case studies of initiatives aimed at overcoming barriers to women's access.)

A contributor to the APrIGF's public consultation also notes the importance of ICTs in enabling her and others to transcend gender inequality, find decent work and become economically empowered (SDG 8) (2016b):

> *Internet access has hugely changed my personal life and helped me change [the lives] of other women around me. The Women's Digital League was formed when I was fired from my teaching job because the private school I was working at would not give me maternity leave. Sitting at home with a simple dial up connection, I found remote work. Earning my first $2.5 writing an article for someone in the US gave me much-needed confidence in my abilities. It was a stepping stone to becoming financially empowered and independent; being recognized as the top most impactful entrepreneurs in Pakistan; and in showing women they didn't have to accept status quo. With greater financial empowerment I have seen young women not settle for the first proposal that came for them as they were no longer a burden on their household; send siblings to school/college; have greater say in decisions at home; be more respected and therefore have a higher self-esteem.*

Contributors note that ensuring women have the skills and capacity to benefit from access is vital. In Cameroon, for instance, a centre for the promotion of female development, CEFEPROD, supports women in developing their capacity to use and manage digital technology (Central Africa IGF, 2016). In Guatemala, the Rija'tzuul Na'ooj library's business centre offers free Internet access, technology and business skills training and space to meet; and have thereby enabled women to learn to advertise their products on social media and to benefit from other skills learned. In Uganda, in turn, the National Library offers ICT training specifically designed for female farmers; thus enabling them to learn more about weather forecasts, crop prices and helping them to participate in online markets (DC for Public Access in Libraries, 2016).

Besides basic skills training, education in media and digital literacy must furthermore address human rights and democratic citizenship online (c.f. Council of Europe, 2016a). Expanding women's study of ICT-related topics and in science, technology, engineering and mathematics (STEM) fields is important to ensure the recruitment of women at all levels of organizations in new information and knowledge societies.

Various initiatives have been created to address the need to ensure women's sustainable development and gender equality in the digital age, including the IGF BPF Gender and Access 2016, which is currently investigating barriers to access as well as the community-led responses to overcome such barriers. Another example is the International Telecommunication Union (ITU) and

UN Women's *Action Plan to Close the Digital Gender Gap*, which recognizes the 'transformative potential' of ICTs for inclusive and sustainable (women's) development (2015). The Broadband Commission also has a Working Group on the Digital Gender Divide in 2016/7, and in September 2016 ITU and UN Women together launched its campaign EQUALS: *The Global Partnership for Gender Equality in the Digital Age*.

Clean water and sanitation (SDG 6)

Summary of targets: Ensure availability and sustainable management of water and sanitation for all

Contributors note that meaningful access can help to promote more sustainable water and sanitation solutions by reducing water waste; enabling better data sharing; promoting smart water extraction, treatment and delivery infrastructure; by developing connected water solutions; and by protecting water and remotely monitoring its quality to allow early detection of contamination.

Samuel Guimarães Lima explains that in Brazil, for instance, embedded systems control water and sanitation management and enable citizens to check information about these systems (Brazil, 2016).

Affordable and clean energy (SDG 7)

Summary of targets: Ensure access to affordable, reliable, sustainable and modern energy for all (also see SDG 13)

Among other things, meaningful access can help ensure access to affordable, reliable, sustainable and modern energy through the use of online platforms for capacity-building related to renewable energy; the implementation of smart energy meters linked to applications that prevent wastage; and by facilitating access to information about energy distribution and conservation. Ericsson, for instance, takes the view that the ICT sector can transform the energy sector by delivering synergies across technologies for sensing and control; the automation of processes; energy storage; renewable energy generation; machine-to-machine interactions; efficient energy use by consumers; as well as smart metering and grids, for instance (2016).

Besides the ICT sector's potential to improve productivity and thus reduce power consumption and carbon emissions, it remains responsible for at least 1.3% of total global greenhouse gas emissions

(as is discussed in more detail in SDG 13 below). Michael Oghia, for instance, warns about the potentially detrimental effect of not only IoT, but also data generation and cloud computing (2016c) on energy consumption.

A recent study by Mike Hazas, Janine Morley, Oliver Bates and Adrian Friday, for instance, takes the view that rising data demand 'has an equivalent direct energy cost as data is transmitted and processed. Despite step changes in energy efficiency as new technology is introduced, this could arguably be offset by innovations in the marketplace such as increased expectations around high-definition video'. These researchers warn that 'the [IoT] is set to trigger a whirl-wind of investment and connected infrastructure growth that has the massive potential to grow operational electricity use and energy of the Internet' (2016).

ICTs and the Internet also, however, have the potential capacity to provide solutions that can reduce energy dependence and wastage in other sectors as a result of development pertaining to smart grids, transportation, buildings, work, travel, services, agriculture and land use. In the ICT sector more specifically, Michael Oghia argues that solutions are already manifesting in various ways and aiming to determine 'how the Internet and ICTs can become completely sustainable in the future as well as better address and ultimately solve 21st century challenges' (2016c).

The IGF DC on Internet and Climate Change similarly notes in its *Statement on Climate Change and the Internet* (2009):

> *… the Internet community is endeavoring to mitigate its own carbon footprint through new energy-efficient data centers, servers, applications and networks, and through the increased use of renewable energy supplies to power the Internet infrastructure.*

Decent work and economic growth (SDG 8)

Summary of targets: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all

Contributors emphasise the importance of meaningful access for sustainable, sustained and inclusive economic growth, as is also confirmed by various studies already done (c.f. GSMA, 2016a; UNHCR, 2016). Among other things, contributors point out that access can help increase efficiency, facilitate the sharing of knowledge, enhance innovation, support the emergence of new business models in the

digital economy, and increase overall productivity and growth. It also supports the development of transparent and efficient systems that support and bolster economic growth, including for e-taxation systems and in sectors ranging from transport, energy and media to banking (e.g. Central Africa IGF, 2016). As Mexico's Federal Telecommunications Institute notes (2016):

> *In recent years, the expansion of digital technology has operated as an engine for economic growth and for the transformation of the society as a whole, which contributes directly to the fulfilment of the SDGs.*

Meaningful access can support full and productive employment by creating new jobs in new products and services; by producing tools to help people search for employment; by providing continuous training and online courses that can lead to more productive employment; and by providing economic opportunities in both urban and rural areas – also for people who might face barriers to finding employment, like women. As the World Bank notes (2016):

> *The internet's ability to reduce transaction costs increases opportunities for people who face barriers in finding jobs or productive inputs.*

In South Africa, for example, a mobile application not only provides job-seeking advice and free coaching but also helps users automatically generate a CV based on users' answers to 12 questions; thus helping them to search for work. As GSMA notes, this application had a total of 300,000 users as of 2014, with 20% of users securing jobs relevant to their interest area and experience (2016a).

For refugees, increased connectivity can also be important in enabling them to become more self-reliant by making it easier to create and sustain their own businesses and to do remote work – something that is particularly important in areas in which refugees face constraints on the right to work or participate in local economies (UNHCR, 2016).

Connectivity can furthermore support small businesses and their owners who tend to find it difficult to access capital and financial services in developing countries; thereby stimulating new enterprises to emerge and grow. As ISOC notes in a background contribution (2015):

> *Mobile money has brought banking services to many small enterprises in countries such as Kenya, allowing them to manage their resources and build their businesses. More than 50% the adult population of Kenya now makes use of mobile money. The Internet is enabling more financial services than just mobile money, including credit and insurance, while online investment facilities, such as Kiva, are also making crowdfunding available to small businesses.*

Contributors furthermore note that connecting and enabling users can help to ensure more decent work by raising awareness pertaining to labour rights and the need to eliminate forced labour. On the other hand, the Diplo Foundation points out while ICT deployment is vital to the digital economy, it can only fulfil its development potential if suitable 'education and capacity building are offered to workers, empowering them for current and upcoming challenges' (2016). This point is similarly stressed by the World Bank, which notes that new opportunities for work come 'hand in hand' with 'fundamental and rapid changes' in the world of work; with digital technologies not only increasing the demand for new and advanced skills, but also rendering other skills obsolete (2016).

The IGF's DC for Public Access in Libraries stresses the importance of libraries as major and/or sole providers of access to the Internet at low or no cost, to supporting economic development. In Latvia, for instance, for every dollar invested in public libraries from 2008 to 2010, nearly USD 2 in value (direct and indirect) was reportedly created. The return on investment of computers and Internet use in public libraries was even higher, returning more than USD 3 for every USD 1 invested (DC for Public Access in Libraries, 2016).

Industry, innovation and infrastructure (SDG 9)

Summary of targets: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation

Contributions indicate that ICTs act as overall enablers to help build resilient infrastructure, promote inclusive and sustainable industrialisation, and foster innovation. As Ogero Telecom notes (Lebanon, 2016):

> *From bringing the most remote villages into the connected society, to solving pressing challenges around urbanization, ICT can have an impact on every one of the Sustainable Development Goals, and will provide essential infrastructure to help achieve them.*

The Diplo Foundation points out that ICT deployment is not only vital to the digital economy but also plays a key role in innovation activities (2016). For developing countries in particular, ICTs offer the opportunity to 'leapfrog old technologies by skipping the intermediate stages of technological development'. VimpelCom also notes in its contribution that it is evolving to a more 'consumer-centric communications and technology company.' It argues that disrupting traditional business models is 'the only way to move the world closer to achieving the SDGs' (2016).

While developments pertaining to the IoT may impact the SDGs more generally, they are particularly relevant to innovation. APC, for instance, points out that continued innovation in the ICT sector pertaining to particularly IoT could have 'an important role to play' in meeting the SDGs (2016a) (as was also addressed in SDG 7 above). IoT, the Diplo Foundation argues, can provide policymakers and communities with valuable and timely information that is will become increasingly important for supporting many of the SDGs, including urban planning and saving public resources, for example. It will also fundamentally impact the traditional lines between digital and physical industries, promising 'a profound change to in the global economy' (2016).

The GSMA takes the view that rural-urban divides have to be addressed if SDG 9 is to be met. In this regard, it points out that third generation (3G) mobile broadband coverage, for instance, only covers about 29% of the rural population but extends to 89% of the world's urban population. It notes that the mobile industry in particular has a significant role to play in developing industry and providing critical infrastructure that can help other industries to develop (2016).

Reduced inequalities (SDG 10)

Summary of targets: Reduce inequality within and among countries

Inequalities within and among countries can be addressed by connecting and enabling more users, including through new opportunities for employment and income generation offered by and through various platforms (also addressed in SDG 8 above). As noted by GSMA, the Internet provides opportunities for low earners to increase their income by gaining access to digital economies; and can thereby accelerate progress towards reducing inequalities (2016a).

For example, a Kenya-based e-commerce tool, SOKO, enables local artisans in over 30 developing countries to participate in the global market place via their mobile phones. By submitting an entry form, vendor profile and product images via text message, producers can set up a storefront on SOKO's website and market their products to online consumers around the world. On average, after two months of joining SOKO, artisans increase their income fourfold (GSMA, 2016a).

To help address inequalities that exist among countries, Ogero Telecom notes the importance of ensuring that a country's interests are reflected and addressed in international decision-making forums (Lebanon, 2016).

Sustainable cities and communities (SDG 11)

Summary of targets: Make cities and human settlements inclusive, safe, resilient and sustainable

Contributors note that connecting and enabling users can help to make cities and human settlements more inclusive, safe, resilient and sustainable by enabling more efficient sharing of information pertaining to services and costs, by reducing administration costs, and by improving access to key areas such as health care, education and banking.

The Zimbabwe IGF notes in its contribution that access can help citizens to, for example, build sustainable smart homes using information they find online, and can also help with security solutions through Internet-monitored security systems (2016). Ogero Telecom argues that broadband and cloud solutions not only deliver e-government services but also help to provide opportunities for constructing smarter and greener buildings; and furthermore enable real-time road and traffic monitoring that can provide municipalities and traffic departments with vital information for the design of traffic and city services (Lebanon, 2016).

Fotjon Costa points out the importance of access in Albania, for instance, where the establishment of a digital archive in offices for immovable property registration has proven useful, along with the closed-circuit television (CCTV) monitoring of roads and crossroads (Albania, 2016). Samuel Guimarães Lima notes the importance of local municipalities and governments sharing vital information to make communities safer, more inclusive (e.g. through the sharing of opportunities pertaining to social programmes), and sustainable (Brazil, 2016).

Responsible consumption (SDG 12)

Summary of targets: Ensure sustainable consumption and production patterns

Connecting and enabling users can help to ensure sustainable consumption and production patterns by supporting better information management. As noted by Ogero Telecom, for instance, the use of cloud services could 'dramatically affect resource use, both in in material and energy' (Lebanon, 2016).

Climate action (SDG 13)

Summary: Take urgent action to combat climate change and its impacts (also see SDG 7)

Contributors note that connecting and enabling users impact climate change in both positive and negative ways. David Souter, for instance, notes that there are two sides to the ICT sector's relationship with climate change (2016).

On the one hand, the ICT sector currently contributes about 2.3% of global greenhouse gas emissions. While this may not seem exceptionally large, the ICT sector's contribution is growing more than twice as fast as emissions from the rest of the global economy (Souter, 2016). Michael Oghia explains that it is not only the infrastructure and devices needed to enable access that contribute to climate change, but to some extent also the effects of its governance (Serbia, 2016c):

> *…to effectively govern a critical global resource means heavy reliance on air travel, which also contributes to about 2% of all greenhouse gas emissions.*

On the other hand, however, the Internet and ICTs can also improve productivity in various other economic sectors; thereby reducing power consumption and carbon emissions (also discussed in SDG 7 above) (Souter, 2016). It can help to raise and improve user awareness of the importance of addressing climate change and teach them ways to reduce impact. For instance, in Poland, a library partnered with environmental experts and ecologists to design an interactive education programme on ecology and the environment; enabling over 2,000 children to learn about environmentally-friendly lifestyles (IGF DC for Public Access in Libraries, 2016).

ICTs can also help to provide access to early warning systems. In Chennai, India, ICTs were crucial in assisting rescue efforts and relief work in 2015/16 floods (public comment response received by APrIGF, 2016b). GSMA also notes that the mobile industry, for instance, can support communities both before and after natural disasters by supporting the development and support of IoT-facilitated environmental monitoring that enables the collection of data that is needed for managing climate change; and by providing emergency broadcasting services (2015; 2016b).

On a more general level, ICT solutions can also help to monitor climate change and planetary processes (c.f. Federal Telecommunications Institute, Mexico, 2016) and to address climate change through innovative solutions such as collaborative tools for smart grids, smart building, optimised

logistics, and delivery services. The DC on Internet and Climate Change points out that the Internet acts as an important enabling technology to combat climate change by, among other things, helping to reduce emissions in other sectors (2009). The Global e-Sustainability Initiative (GeSI) has estimated that the potential impact of ICT-enabled solutions can be as much a 15% of total global carbon emissions per year (2010).

Besides the indirect carbon reduction benefits of broadband and ICTs, broadband-enabled ICTs like cloud computing (also discussed in SDG 7 above) also have potentially direct carbon reduction benefits. A Microsoft, Accenture & WSP study, for instance, indicates significant decreases in CO2 emissions per user across the board for cloud-based versus on-premise delivery of three Microsoft applications studied (2010).

Initiatives such as the GeSI can potentially help to share important information and best practices on ways to address e-waste solutions by driving the 'ICT sustainability agenda' through tools such as GeSI's ICT Assessment Methodology, which provides guidance on the process of 'identifying and quantifying the carbon-reducing effects of implementing an ICT solution'. It is important, however, that a better understanding is gained of how ICTs can benefit and support climate action in line with the SDGs. As GeSI notes (2010b):

> *ICT has tremendous potential to improve energy efficiency, cut carbon emissions and mitigate climate change. However, to understand and promote these benefits, merely implementing ICT solutions will not be sufficient—quantification of their impact is also critical.*

Life below water (SDG 14)

Summary of targets: Conserve and sustainably use the oceans, seas and marine resources for sustainable development

Contributors note that meaningful Internet access can help to raise awareness of the importance to conserve and sustainably use the oceans, seas and marine resources. Contributions for instance point out that connectivity can help to monitor water flows, rain, snow, winds and to provide more effective early warning systems to protect species and fragile land areas, for instance.

Life on land (SDG 15)

Summary of targets: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

Similar to the ways in which meaningful access can support and protect life below land, it can also enable the protection, restoration and promotion of sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and biodiversity loss.

The Council of Europe notes that involving more citizens in science, especially through the use of web platforms, applications and other Internet-based infrastructure and tools, can help to create new knowledge, provide data, and support informed decision-making in the environmental field; indirectly improving the planning of conservation actions (Council of Europe, Democratic Directorate Governance, 2016a):

> *Improving connectivity of the large public can support their engagement in citizen science, contribute to the monitoring of both terrestrial and marine ecosystems and thus support world efforts in halting biodiversity loss.*

Peace and justice (SDG 16)

Summary of targets: Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels

Contributors note that meaningful Internet access can help to promote peaceful and inclusive societies for sustainable development by, among other things, enabling and educating citizens to become increasingly engaged and enlightened and to participate more directly in their communities through, for example, e-petition platforms.

The Council of Europe points out that online platforms enable 'petitioning, policy initiatives, problem-solving and pooling of expertise and crowdsourcing applications which increase the transparency of political processes and decisions'. Citizen-driven movements have, however, also led to criticism about the true impact of online civic participation, along with concerns about the

protection of users' personal data, undue influence of voters' opinions, and the proliferation of online hate speech (2016a).

On the other hand, applications can also provide solutions to challenges threatening inclusive and peaceful societies. In Egypt, the application HarassMap, for instance, crowd-sources reports of sexual harassment using SMS and online reports and maps them online. The map helps to illustrate the scale of the problem and to raise awareness (Oghia, Serbia, 2016a).

Meaningful access is also important in the creation and sustenance of peaceful societies, as well as some countries' transition to peaceful societies. As the DC for Public Access in Libraries points out, in Colombia communities that have historically experienced severe violence are also often without Internet, voice or data networks. Through a social organization, MAKAIA, an initiative to use TV white space to connect such communities hopes to allow meaningful access to complement peace processes (2016).

Increased access to information will also subject elected institutions to more scrutiny from engaged and empowered citizens, compelling such institutions to become more transparent and accountable (Council of Europe, 2016b). It can similarly help them save valuable resources (including for materials and administrative staff) and reach more citizens faster and more efficiently through e-government and e-services. To promote e-voting and e-democracy, the Council of Europe notes that there is a need for agreed and enforceable rules on a global level pertaining to the rights and obligations of Internet companies in relation to 'their influence on political debate'; the authentication of users; the protection of personal data; and the curbing of hate speech (2016a).

Because citizens may increasingly have to rely on online services, many contributors point out that it is important for governments and other stakeholders to support digital literacy development campaigns to ensure citizens are not left behind as services are increasingly available only online. The Council of Europe, for instance, notes that educational measures are vital to support e-democracy (2016a). The DC for Public Access in Libraries points out that librarians are particularly well equipped and positioned to, along with other stakeholders, provide users with the tools and skills necessary to not only access and peruse content, but to also produce and share content (2016).

ICTs are also important in providing and sharing information that is vital to sustainable development, including raising awareness of human rights in a manner and using content that makes sense to local contexts and in local languages. Contributors point out that a better understanding of human rights may also help to counter abuse and violence; also online.

More generally speaking, contributors note that access to the Internet can help to decrease the costs of litigation and access to justice for all through the development of online services (e.g. online small claims courts, e-discovery, e-filing, or streamed court proceedings). In Albania, for instance, access to justice is facilitated through the digitization of court archives, the integration of various case systems and the development of web services linked to other governmental registers and actors (Costa, 2016). Meaningful Internet access can also enable more citizens to engage with justice and legal proceedings by learning more closely about legal proceedings through, for instance, following court reporting on social media platforms (as long as such reporting is fair, balanced and accurate and adheres to ordinary journalistic ethics/standards).

As the Council of Europe points out, however, various forms of (online) abuse and violence threaten ICTs' ability to positively impact the development of inclusive and peaceful societies. For this reason, it is also important that effective, accountable and inclusive institutions are developed to support sustainable development and protect human rights online (c.f. IGF BPF Online Abuse and Gender-Based Violence 2015 recommendations). Where online forms of abuse and violence are concerned, for instance, law enforcement agencies (including police officers) and other members of the judiciary (including law clerks, magistrates and judges) have to be trained to adequately and fairly prosecute and deal with the crimes and offenses that are enabled through ICT use in a manner that respects the privacy and other rights of victims. Similarly, national legislation needs to reflect and adequately deal with online forms of abuse, violence and other offenses, including hate speech. (Council of Europe, 2016a).

Contributors also note the importance of providing wider institutional support for e-participation, for instance. The Council of Europe points out that 'one of the biggest challenges' is to convince civil servants and political leadership to interact more actively with citizens, just as it might be difficult to convince 'disillusioned and sceptical citizens to use them' (Council of Europe, 2016b).

The UNHCR notes that connectivity can help refugee populations by enabling support and humanitarian agencies to provide security-enhancing services so that relevant information can be shared in a timely manner on websites; by streamlining asylum processes; by providing hotline services to support those in need; by enhancing incident reporting and tracking; and by ensuring female refugees' safety (2016).

Lastly, Ericsson stresses the importance of adequately measuring progress in the achievement of the SDGs, including by ensuring that all citizens have legal proof identification (the need for which is expressed in SDG target 16.9), and notes that this right affects a citizen's right to vote, open a bank

account, go to school or access health services, for instance. It takes the view that digital identities can 'leapfrog analogue ID infrastructures and scale access to, and participation in, the digital economy (2015).

Partnerships for the goals (SDG 17)

Summary of targets: Strengthen the means of implementation and revitalize the global partnership for sustainable development

Meaningful Internet access can provide tools for strengthening means of implementing the SDGs, and can also help to revitalise and catalyse the global partnership for sustainable development. As Ogero Telecom points out, it is vital that the importance of ICTs and Internet access as enablers for development be recognised and addressed in a consistent manner across various sectors, including education, health and banking (Lebanon, 2016).

VimpelCom notes in its contribution that it believes that 'companies should take the responsibility to act as engaged corporate citizens' and that 'large companies can serve as a platform, enabling individuals and entrepreneurs to be active participants rather than passive beneficiaries of the digital world'. As an example of such cooperation, it mentions an incubator centre that supports local entrepreneurs recently launched in Bangladesh with the support of VimpelCom and the Bangladesh government (2016):

> *This shows that by taking a broad approach to doing business, companies can be facilitators of bottom-up innovation in addition to delivering technological development top-down.*

Ericsson argues that while many governments are 'at least two to three technology cycles behind the technology frontier', it is vital to raise awareness of the positive potential of ICT in, for instance, delivering public sector services. It argues for not only better use of USFs, but also for more public-private partnerships and new business models that can help to bridge 'the last mile of connecting the unconnected'. The role of policymakers in 'mobilizing national collective action to leverage ICT for digital transformation' is also stressed by Ericsson in its recent report on the role of ICT in supporting the SDGs (2016).

At the APrIGF, the importance of multistakeholder coordination and collaboration to support the SDGs was furthermore stressed; including the need to share knowledge, expertise, technology and financial resources (2016a). The Council of Europe similarly takes the view that multistakeholder mechanisms are vital in reaching the SDGs. It argues that Internet governance needs to become 'more democratic' and that the establishment of a 'multi-disciplinary framework for Internet governance and information society policy development and implementation' could help to widen essential stakeholder participation and collaboration (2016b). In another recent report, GSMA takes the view that cooperation is crucial in reaching the SDGs (2016b):

> *The SDGs are for all of us, in all our roles: for governments, public and private enterprise, society, and as individuals. Unlike the narrower scope of the MDGs, the SDGs create a common language for sustainability and provide a common framework for the ambition to create a better world.*

PART B

LOCAL, NATIONAL AND REGIONAL SPECIFICITIES

Introduction

When the framework for Phase II of *Connecting and Enabling the Next Billion(s)* was developed, various stakeholders emphasized the importance of investigating local, national and regional specificities that are relevant when tackling connectivity challenges. Similarly, many contributions received in Phase II stressed the differences in access to and costs of broadband in developing and LDCs versus developed countries; along with the particular difficulties certain groups have in gaining access (e.g. women, elderly and/or disabled people) (e.g. ISOC, 2015), the impact of rural contexts (APC, 2016b), as well as other specificities. APC, for instance, points out that of the people who are not yet online, the vast majority derive from developing regions (2015a).

To gather more information on these specificities, NRIs were encouraged in particular to submit input identifying local challenges and showcasing success stories in addition to general outreach in a call for input (see the Methodology for more details regarding the methods used to gather contributions).

In their contributions, many stakeholders reiterate the importance of taking local conditions into account in adapting policy options for connecting and enabling the next billion(s). For instance, a public comment received by the APrIGF when it gathered input for Phase II notes that 'technology is not working in vacuum, the same with the Internet. It depends on many factors and how you connect is also important' (2016b). Mexico's Federal Telecommunications Institute similarly points out that each country has 'its own peculiarities, complexities and challenges' which have to be considered when developing and implementing recommendations and strategies (2016). APC also stresses its contributions that 'there is no "one-size-fits-all" solution' to connecting and enabling the next billion(s) (2016a) and that 'local conditions vary considerably from country to country' (2015a).

In compiling this part of Phase II, contributions were analysed for commonalities and differences with the aim of identifying themes important when adapting, developing and implementing policy options for connecting and enabling users at diverse levels. These themes are not only potentially

useful to local communities and policymakers, but also to investors and the variety of initiatives currently addressing digital divides.

Important factors, characteristics and/or themes that were extracted from contributions, as well as the ways in which these factors, characteristics and/or themes can inform local, national and regional initiatives aimed at addressing connectivity, are discussed in this section. Part C thus aims to highlight lessons for future implementation and the development of policies, initiatives, programmes and/or strategies aimed at connecting and enabling the next billion(s) at local, national and regional levels.

Overview: gaining a comprehensive understanding of local contexts

In developing policy options at local, national and regional levels, it is vital to first ascertain what both the demands and unique needs of every location and every community in a location are. The South Eastern European Dialogue on Internet Governance (SEEDIG), for instance, notes that (2016):

> *When it comes to building policies for bridging the digital divide, the first step that needs to be undertaken is a comprehensive analysis of the real situation, based on accurate and reliable data. Such data would then constitute the basis for developing policies that are targeted at addressing the specific problems identified.*

This understanding relates to challenges pertaining to both the supply side – including the demands specific to a location itself by virtue of certain geographical characteristics; the nature and quality of existing infrastructure; the general investment environment in existence (including market conditions and the legal and regulatory framework concerned) – as well as demand-side challenges, including the need for local content and cultural aspects that will influence and possibly determine the particular demands of a community. Whilst these and other factors are discussed in separate sections for ease of discussion below, many of them are closely related and/or interlinked, and should neither be considered nor addressed in vacuum.

Meeting real needs in a transparent, open manner

One of the most common themes in the contributions received in Phase II relate to the need for governments, policymakers and other stakeholders to properly **consider communities' and**

people's priorities and needs when attempting to address connectivity challenges (c.f. Central Africa IGF, 2016).

Michael Oghia stresses that 'it is critical to know what the needs of a local population are' (Serbia, 2016b); while Anthony Namanga refers to experiences in his own country to emphasise the importance of taking into consideration culture when developing connectivity and other policies. He notes, for instance, that some people in Cameroon do not want to be connected because of religious beliefs and customs (Cameroon, 2016). Said Zazai points out that meeting needs and raising awareness of what the Internet can offer users are vital elements to connecting and enabling the next billion(s). He argues that local initiatives tend to have an organic, home-grown approaches that meet the needs of users better than 'foreign' approaches (Afghanistan, 2016).

A recent report by GSMA and LIRNE*asia* in Myanmar on gender, mobile phones and the Internet similarly indicates the importance of cultural norms and stereotypes in determining certain population groups' access to and use of the Internet. The report shows that women are 29% less likely to own a smartphone than men in Myanmar due to a combination of reasons, including low income and traditional gender roles. Men in the country tend to have a more prominent role in households 'based on the religious belief that only men can become a Buddha'; while many women took this situation so for granted that they did not consider it to be 'discrimination' (2015).

Regulatory or policy strategies to aid Internet access should be developed and planned through, as APC notes, 'extensive **public consultation** which include all stakeholder groups – national and regional government structures, private sector and civil society' (2016a). Kim Lilianne Hendi similarly stresses the importance of engaging networks and other stakeholders in the process of designing and implementing policies and programmes, 'especially in rural and remote areas'. She argues that such engagement procedures increase opportunities for the policies to be adopted and to have long-term effects; and notes that among other things, success in implementation occurs when design 'included the promotion of meaningful use and application'; ensured initiatives' continuity and sustainability; and also duly consulted with local experts in the process (Canada, 2016).

Data collection, particularly on usage and user perceptions and preferences, also needs to be **transparent** (Diplo Foundation, 2016; Oghia, Serbia, 2016b). Shreedeep Rayamajhi stresses the importance of properly and transparently communicating about policy initiatives and proposals before implementation (Nepal, 2016). In its contribution the Diplo Foundation, furthermore, recalls surveys conducted by the Brazilian Internet Steering Committee (CGI.br) on the use of ICTs in households, by companies, and in the education sector in Brazil; noting that such surveys were

successful in gathering 'sound information about the evolution of the Internet, helping policymakers to protect its future' (2016).

Lastly, **good practices** should be shared as part of the drive to communicate better with all stakeholders in respect of plans and initiatives. Mexico's Federal Telecommunications Institute, for instance, has recently instituted reforms that among other things led to the creation of an 'Infrastructure Deployment Microsite' to 'compile and disseminate information related to the regulations at different levels' in order to raise awareness and promote the development of local digital projects (2016).

Mapping the relevant terrain

Rural areas, dense forests, mountainous areas and small island states face particular challenges in addressing connectivity challenges because the deployment and maintenance of certain types of infrastructure to and through such terrains are often technically challenging (Diplo Foundation, 2016; GSMA, 2016a; APrIGF, 2016a; APC, 2016b). Samuel Guimarães Lima explains that in Brazil, for instance, the local army has to be used to install optical fibre in certain areas, including the Amazon basin region (Brazil, 2016). Said Zazai similarly notes that countries in rugged mountainous areas, especially in the Himalayas, or small islands scattered all over the Pacific, face particular deployment challenges rendering Internet access expensive (Afghanistan, 2016).

A background contribution from ISOC notes the importance of **terrain and geographical location** in, for instance, Africa. In 20 countries studied in ISOC's contribution, 16 countries are landlocked and can 'by definition not benefit directly from submarine cable landing station'. These countries, ISOC notes, can 'benefit from the presence of (multiple) cables landing in different neighbouring countries, by owning a stake in a cable landing station in a neighbouring country, through improved terrestrial connectivity, and by developing a virtual cable landing station at their border' (2013).

Besides terrain, GSMA points out that **climate** – particularly high humidity levels and violent events such as storms – can impact satellite signals detrimentally too (2016a). The **size** of a country is also important, as smaller and lower-income countries will be less likely to offer competitive markets for potential investors (APC, 2016a).

Similarly, **population density** in the area concerned also impacts connectivity. GSMA argues that in order for a site to be viable for building mobile towers, for instance, its needs to have approximately 3,000 active daily users. But, as GSMA also points out, rural areas represent over 90% of the earth's land surface with population densities often below 100 people per square kilometre (GSMA, 2016a). SEEDIG notes that in Slovenia, for instance, government intervention was needed to expand telecommunications networks to many rural areas that were not attractive from an investment perspective due to the high costs involved in expanding infrastructure (2016).

Despite these challenges in reaching particularly rural and remote areas and landlocked and island countries, the APrIGF argues that progress has been made in Asia Pacific countries, for instance. Not only have there been innovative approaches, particularly in providing last mile connectivity, but it is hoped that initiatives like the Asia-Pacific Information Superhighway (AP-IS) project will significantly support the availability and affordability of ICTs in the region (2016).

On the other hand, APrIGF also expresses concerns about the Asia Pacific region's increased exposure to natural disasters as a result of climate change. It points out that ICTs can help to manage the risks of such disasters, and that it is important to therefore ensure the development of resilient infrastructure that can continue to support communities when national disasters occur (2016).

Taking stock of existing infrastructure

It is also important to take due cognisance of the nature and quality of infrastructure, as well as the 'current state of connectivity' in the country or region concerned (Federal Telecommunications Institute, Mexico, 2016). Existing infrastructure is closely related to terrain, as geopolitical and geographic factors are critical to determining the location of **IXPs** and traffic hubs, which in turn help to create competitive markets in the vicinity of such locations (APC, 2016a), as well as to develop more local content (APrIGF, 2016) (c.f. the IGF BPF on IXPs for more information). A country's readiness to transition to **IPv6** is also important in implementing long-term solutions to access (SEEDIG, 2016) (c.f. the IGF BPF on IPv6 for more information).

Other contributors point out that not only existing broadband capacities in a location should be considered, but also other basic infrastructure such as the availability of reliable electricity, safe and passable roads, and public buildings (c.f. APrIGF, 2016a; GSMA, 2016a; Oghia, Serbia, 2016a). Connectivity's (current) reliance on other infrastructure (including electricity grids, access roads,

etc.) means that stakeholders addressing connectivity challenges should do so in a holistic, future-focused manner. As GSMA, for instance, notes with specific reference to mobile operators working in certain parts of Africa and South-East Asia that often suffer from a lack of basic infrastructure (2016a):

> *Mobile operators must, as a result, build each site in a self-sufficient manner adding to the up-front deployment costs and ongoing operations and maintenance costs.*

Current and future **demands** also need to be investigated. Ogero Telecom, for example, notes in its contribution that an action plan was recently developed by the Lebanese Ministry of Telecommunications in conjunction with Ogero Telecom in response to 'huge' demands created by big data; 'knowing that this project will attract foreign investments into Lebanon while contributing to economic development and providing job opportunities'. Among other things, this plan consists of replacing existing copper cables with fibre networks and improving mobile technology by optimising fourth generation (4G) networks (2016).

As Ogero Telecom notes, the Lebanese Ministry of Telecommunications 'took into consideration the current situation of the local Lebanese market', the emergence of new mobile networks, as well as increasing demand on Internet bandwidth. While the plan includes various things, some highlights include the reduction of communication tariffs on local, international and mobile calls along with 'sharp decrease' in Internet service fees, which has resulted in an increase in Internet penetration in Lebanon from 70% in 2013 to 86% in 2015 (2016).

Understanding the market and general investment environment

Another important consideration in addressing access needs is how **competitive** a market is – i.e. the extent to which operators and investors can participate freely in a market without, for instance, being encumbered by incumbent operators. Market dominance naturally also affects availability, cost and quality of service; and in some regions incumbents are likely to be protected by governments to the detriment of the market (APC, 2016a).

For example, the Federal Telecommunications Institute of Mexico notes that the country's telecommunications market was historically characterised by 'high monopolistic concentration that caused services with low coverage, poor quality and high prices' which, in turn, 'limited the exercise

of freedom of expression and the right to information' of citizens, 'as well economic, social and cultural development' (2016).

To address these shortcomings, a constitutional reform in 2013 confirmed among other things that 'telecommunications and broadcasting are public services of general interest' and that Mexico shall 'guarantee the right of access to [ICTs]', including the Internet. The reform also allowed structural changes in the local markets due to the creation of a more enabling environment 'for the establishment of solid and reliable regulatory policy through the creation of the Federal Telecommunications Institute'. Changes included allowing foreign direct investment (FDI) of up to 100% in telecommunications and satellite communications, and up to 49% in broadcasting. The objective of this reform, which aims to expand networks through 'public, private or mixed investment' is to increase the coverage and quality of telecommunications services and to promote competitive prices. In 2015, private investment in Mexico grew almost 35% in 2015, while FDI in Mexico grew from 1% before the reform to 10% in 2015 (Federal Telecommunications Institute, Mexico, 2016).

In Romania, for example, local government specifically aimed to create enabling environments for investment in infrastructure, particularly in underserved areas. Besides the provision of physical access, other initiatives in the country have supported Internet use through, for instance, public libraries equipped with computers and broadband access, and librarians have been trained to support local communities in using the Internet (SEEDIG, 2016).

In an African context, furthermore, a study by ISOC notes that although there might have been significant improvements in Africa's Internet connectivity levels, 'investments have not always translated into a corresponding improvement in the Internet access services experienced by users, through lowered prices or increased quality of service'. ISOC argues that policy remedies are need to 'remove roadblocks for new market entry and expansion', to 'promote investment by providing clear rules' and, lastly, to 'provide strong leadership' to meet connectivity goals in Africa (2013).

Not only local competition regulation is important in allowing new entrants and investors, however, but contributors to Phase II also highlight other factors needed to establish regulatory frameworks. These include factors such as how onerous **licensing** for Internet service providers (ISPs) is, whether a country allows innovative **spectrum** usage and spectrum re-farming, and to what extent **infrastructure sharing** is allowed (c.f. GSMA, 2016a; SEEDIG, 2016; Facebook, 2016; APC, 2015a, 2016a; ISOC, 2013; A4AI, 2016a). In respect of the latter, GSMA points out in its contribution, with specific reference to mobile operators, that (2016a):

> *…mobile operators are increasingly adopting alternative methods to network coverage expansion, notably infrastructure sharing and partnerships with other ecosystem players, to complement traditional network deployments.*

GSMA notes that there are various models of infrastructure sharing available, and selection depends on 'a range of factors including the prevailing regulatory environment, market characteristics and individual operator strategies'. It also takes the view that infrastructure sharing models often obviate the need for public subsidies and/or development funding and can thus have 'a profound, positive impact on the economics of network expansion into rural and remote areas' while preserving competition and commercial sustainability (2016a).

APC similarly argues that infrastructure sharing is a good way of maximising private investment to extend telecommunications networks and reduce their costs (2015b); and refers to research that shows that in developing countries specifically, infrastructure sharing can 'save billions' (2015a):

> *These savings can be obtained both through sharing telecom infrastructure (such as ducts, fibres and masts) as well as sharing with other utility infrastructure such as roads, power grids, fuel pipelines and rail lines (these are often also called linear, passive or alternative infrastructure). In urban environments water supply and sewage systems can also provide sharing opportunities.*

APC takes the view that 'the level of **institutional development** of the policy and regulatory agencies needs to be first taken into account in determining where resources first need to be applied' (APC, 2016a). Said Zazai notes that the extent to which a local government realises and supports the need for enabling access, also in the form of relevant policies, is vital to how attractive a market is for foreign or local investment (Afghanistan, 2016).

The APrIGF also notes that **digital economy and trade** offer much in terms of the development of the global economy, but will only be successful if investment and regulatory environments are supportive of the free flow of information – a point that is echoed by the Pan-European Dialogue on Internet Governance (EuroDIG) in its submission (2016). The APrIGF argues that close collaboration is needed among all stakeholders to ensure that a network of free trade agreements will require 'member states to maintain the free flow of information and to ensure the prohibition of data localization as well as source code disclosure unless there is a legitimate public policy reason' to allow an alternative. Where multilateral free trade agreements are concerned, the APrIGF takes the view that 'necessary mechanisms' should be incorporated into such treaties to ensure that the 'further

development of digital economy for developing countries is not compromised in any way' and to include 'offsetting measures that provide a level playing field' to all stakeholders (2016a).

Lastly, the Central Africa IGF is concerned that in countries like Cameroon, Chad, Congo Brazzaville and the Democratic Republic of Congo, some 'crucial questions' pertaining to infrastructure development and the related regulatory policies were not understood properly by 'most policymakers'; enabling private organisations to benefit from an 'unstructured environment' to the detriment of users (Central Africa, 2016).

Ensuring that access is *meaningful*

APrIGF points out that Internet access does not automatically translate into meaningful use. The need for addressing demand-side challenges such as affordability; awareness and digital skills; the availability of relevant content and services; security, privacy and trust; as well addressing underlying cultures and norms that affect access, is therefore important (2016).

While most of the considerations pertaining to meaningful access discussed in Part A are applicable in local contexts, it is also important to consider how meaningful access is regarded in specific regions. This extends from the quality and speed of access itself to the availability of relevant content, the ability to use content, the extent to which human rights are promoted and respected online, and whether women and marginalised groups are able to benefit from meaningful access.

A contribution from SEEDIG, for instance, points out that there are 'many layers' of Internet development in the South Eastern European region, and that the deployment on infrastructure 'is insufficient in itself' and needs to be complemented by measures focused on **education and development of local content**, among other things (2016). A background contribution from ISOC notes that Internet availability now 'far outpaces adoption' and that there is a need to place a greater emphasis on the demand by facilitating local content availability and distribution. ISOC notes that in the countries it studied in Africa, the majority of content is hosted outside the country and typically overseas. For instance (2016a):

> *…in Rwanda, for all .RW websites, only a very small fraction are hosted in Rwanda, and the rest are hosted predominantly in Europe and the US. Based on work that we did recently in Rwanda,*

overseas hosting can have a significant impact on the cost and latency of accessing the content, which acts to depress usage.

The Broadband Commission points out that only about five percent of all existing languages are accessible online (2016b). Said Zazai similarly stresses the importance of **local content** and the use of local **language** in creating demand for Internet among more in the Asia Pacific region (Afghanistan, 2016). ISOC stresses the need for ensuring the existence content in languages that are not widespread on the Internet (2015) – including, for example, in Sub-Saharan countries whose populations are not always comfortable in the official government language (ISOC, 2016c).

SEEDIG notes the importance of promoting multilingualism and the availability of relevant content in local language in its submission with specific reference to internationalised domain names (IDNs). Noting that **IDNs** 'are seen not only as a tool for potentially bringing people online, but also a way of reflecting national identity', it points out that various countries in the region have already or are in the process of introducing IDN country code top-level domains (ccTLDs). In Serbia, for example, the use of IDNs to reflect the diversity of languages and scripts used by the country's recognised national minorities is also being explored. To enable universal acceptance of IDNs, however, SEEDIG recommends 'extensive and continuous cooperation between the technical community, the private sector, and, to some extent, public authorities' (2016).

Like many other contributors, Mexico's Federal Telecommunications Institute acknowledges that while some progress has been made in expanding levels of access, more needs to be done to ensure that the Internet and other ICTs' potential for sustainable development be realised. One way in which it aims to do so in Mexico more specifically is by granting concessions for community and indigenous social use with the aim of promoting local culture and language and supporting wider citizen participation, including the participation of traditionally marginalised groups (Federal Telecommunications Institute, Mexico, 2016).

EuroDIG similarly stresses the importance of creatively meeting the needs 'of all minorities' to facilitate meaningful access; and argues that Internet companies and governments share responsibility to help design commercial solutions to promote access, while governments, it notes, have the duty to 'enable full enjoyment of human rights online for all users' (2016).

The APrIGF also emphasises the importance of **human rights** as being 'central' to the Internet and notes that topics related to the protection and promotion of human rights online were the subject of 'intense scrutiny and debate by all stakeholders' at the annual APrIGF meeting. It points out that

network shutdowns and blocking, for example, not only have 'serious economic consequences' but also impede the free exercise of human rights online (2016a).

The APrIGF also takes the view that when legislation that was designed to govern offline spaces are used with newer legislation aimed at online conduct and behaviour, such developments must similarly protect human rights. States should also 'be urged to reconsider' mutual legal assistance agreements (MLATs) are implemented to ensure that the right to privacy, access to justice and the rule of law are upheld when individuals' data is shared with states; and information about data requests must be available to the public 'for the interest of transparency and accountability' (2016a).

The APrIGF furthermore highlights the importance of enabling stakeholder collaboration (addressed in more detail below) to develop effective regulatory frameworks and to protect freedom of expression, the free flow of information, and the protection of children and youth online from illegal and harmful content. It proposes the adoption of the three-pronged test of legality, legitimacy and proportionality in shutting down or interrupting access, investigation and/or prosecution in all participating countries (2016a).

While 'expectations of privacy may vary' between and among cultures and regions, protection mechanisms must not only meet internationally recognised measures to protect privacy, but 'the highest level of protection should be guaranteed as a default safeguard'. This, the APrIGF argues, will enable the protection of privacy despite differing levels of protection in diverse jurisdictions and the 'general lack of user awareness' (2016a). EuroDIG similarly highlights the fact that Internet freedoms vary among countries. As Thorbjøn Jagland, Secretary General of the Council of Europe, noted at EuroDIG's annual event (2016):

> *Different countries, including in Europe, employ different approaches, meaning that, currently, how free and open your Internet is depends on where you live. And these imbalances are something the Council of Europe is trying to correct.*

The **right to be forgotten** should, the APrIGF argues, 'be approached with caution' as challenges pertaining to its extraterritorial and practical application must be balanced with applicable rights; and it argues that emerging jurisprudence on the topic 'imposes a burden on proving public interest' on both people searching for data and the entities facilitating such searches, including intermediaries. In respect of the latter, it also points out that intermediary liability needs to be addressed to enhance the use of the Internet; and notes that while more work needs to be done on implementation, the Manila Principles provide a useful framework for addressing intermediary responsibility.

The need for addressing the **gender** digital divide is another requirement that the APrIGF highlights for the Asia Pacific region. This includes not only access and affordability, but also 'persistent disparities in literacy and income', various barriers related to social and cultural norms, and online abuse and gender-based violence. In respect of the latter, the APrIGF notes that online threats:

> *…limit women's ability to take advantage of the opportunities that ICTs provide for the full realisation of women's human rights, act as a barrier to access that can exacerbate the gender digital gap, violate women's human rights, and reproduce gender stereotypes and discrimination.*

To address gender-based abuse and violence online, the APrIGF recommends multistakeholder action 'through a range of strategies from the framework of human rights, including capacity-building, more effective complaints and redress mechanisms, inclusive decision-making processes, and/or appropriate legislative and policy-based responses' (2016a) (discussed in more detail below).

EuroDIG notes in its contribution that enabled users are users that can also take responsibility for online activities. Outputs from one of its workshops include that access is also about 'informed consent, related **skills and education**, and therefore having the capacity to fully participate online'. To this extent, EuroDIG takes the view that there is a need for media literacy training in formal and informal settings, as well as education to ensure that human rights are both understood and respected online (2016).

Said Zazai also stresses the importance of basic literacy for enabling meaningful Internet access, noting that literacy levels and Internet use have a 'direct correlation'. He similarly notes the importance of digital skills to make better use of the Internet and to enable entrepreneurial activities online; thereby supporting the SDGs (Afghanistan, 2016). Findings from 1 World Connected in case studies from both North America and Africa confirm this argument, and further point to the need for digital literacy to 'go beyond' basic ICT training to teaching users to use the Internet for specific outcomes, such as applying for a job, or getting help for homework, in order to be truly meaningful (2016). SEEDIG confirms the importance of digital literacy, and explains that various initiatives aimed at improving literacy is underway in the region (2016):

> *In Georgia, for example, the government, in partnership with civil society organisations, is delivering training to local communities, with the aim to educate individuals on how to use the Internet in a meaningful way.*

Promoting trust and security to ensure meaningful access

EuroDIG takes the view that the only way in which the Internet will be beneficial, or meaningful, is if it is also 'free, open and secure', with **trust** being 'key in embracing the digital revolution'. At EuroDIG's annual event, the need for better collaboration between industry and governments to ensure trust and privacy was stressed (2016). As Günther Oettinger, the European Union Commissioner for Digital Economy and Society, European Commission, noted at EuroDIG:

> *Trust is indeed key in embracing the digital revolution… The data initiative along with new Data Protection rules are examples of how the European Union can contribute to boosting trust so as to ensure that citizens and companies can fully benefit from the digital revolution.*

EuroDIG argues that in understanding and defining cybersecurity, the focus should be both on the end user as well as on the technical community and local justice departments. Intermediaries, it argues, 'cannot be the cheap police of the Internet' by substituting states' responsibility to act responsibly in protecting human rights (2016).

The importance of trust is also emphasised by the Croatia IGF, which notes that national cybersecurity and the protection of minors, for instance, are key elements of a new national cybersecurity strategy and related action plan adopted by the Croatian government in 2015. As the Croatia IGF points out, '[u]sers need to be comfortable to use services offered via [the] Internet' (2016). The Central Africa IGF similarly stresses the importance of issues related to the safe and stable operation of Internet infrastructure, including cybersecurity and the management of unsolicited communications (spam) (2016).

In its contribution, the APrIGF notes that **cybersecurity** 'is critical not just to the stability of cyberspace, but also increasingly important to the physical world'. It argues that collaboration is needed both within and beyond the Asia Pacific region to mitigate and prevent cybersecurity incidents; and that emerging technologies such as IoT and machine-to-machine (M2M) communication will pose new security considerations and challenges that should already be addressed from the design stage of related devices (2016a). It recommends that legal and regulatory frameworks pertaining to cybersecurity, data protection, surveillance, anonymity, intermediary liability and cybercrime must uphold and protect human rights, discussed in more detail in the next section.

Enhancing multistakeholder collaboration

APrIGF notes in its contribution that the multistakeholder model in Internet governance 'encourages coordination and planning through a consensus-making process and recognizes the need to incorporate regional and local Internet governance context and strategies'. It argues that the model should 'form the basis of policy-making processes and initiatives which are inclusive, transparent and accountable to all stakeholders' (2016a). ISOC takes the view that cooperation among stakeholders 'will be crucial in formulating development strategies and programmes that bring together development priorities and the potential of the Internet' (2015). A4AI also notes in its *Affordability Report 2015/16* that an integrated approach to policymaking is required to ensure universal access (2016a):

> *Getting everyone online requires balanced policies that address demand as well as supply; regulation as well as competition; fixed-line broadband as well as mobile; public access as well as consumer affordability. This demands cooperation across ministries, between geographic units (local, state and national), and among private sector stakeholders, whose business interests may be very different.*

Various contributors to Phase II also emphasise the importance of **public-private** collaboration in supporting connectivity drives, although consideration should also be given to the private sector's economic/financial capacity to engage in such partnerships. Government incentives can help, some contributors point out, to help connect areas that are not economically viable for most private institutions to serve (Diplo Foundation, 2016). The APrIGF similarly notes that 'combined input' from all sectors is needed to create innovative business models that support sustainable initiatives that can solve challenges pertaining to affordable access and the promotion of digital literacy, among other things (2016a). The Croatia IGF argues that multistakeholder national IGF initiatives are also important in supporting the expansion of meaningful access and Internet governance more broadly (2016).

A joint report by ISOC and Analysis Mason on barriers to connectivity in Africa furthermore stresses the importance of **high-level leadership** to promote investment and remove roadblocks (2013). This need is echoed by A4AI, which notes that government ministers and others must 'spearhead efforts to convene all actors and develop a clear, coherent plan for sequencing reforms and stimulating the investments needed to enable reduced costs and wider access' (2016a). Noting that markets with higher prices and lower levels of Internet use 'tend to be characterised by barriers and

obstructive government involvement in the sector', ISOC points to certain examples where government interference jeopardises development (2013):

> *Ivory Coast operates a monopoly on the international gateway; incumbent operators in Cameroon and Botswana remain state-owned; and crossing borders in Southern Africa has been described as bureaucratically challenging.*

The Diplo Foundation furthermore notes that the support of **civil society** as a form of bottom-up social organisation, as 'focal points' and as 'disseminators of capacity-building initiatives at local level' is similarly important for the development of policy options for connecting and enabling people. Civil society could furthermore help communities 'self-organise to tackle some of their connectivity problems', it argues, and refers to the creation of community networks as an example of such self-organisation (2016).

Further research and some concerns

Some contributors lament the apparent lack of **research** being conducted to identify how appropriate technologies and Internet connectivity can effectively contribute to sustainable and inclusive development at local levels in specific regions. A public comment received by the APrIGF, for instance, notes that while SDGs provide significant focus areas for development in regions such as the Pacific, and ICTs and connectivity 'could be a major contributor to this development', there is a lack of adequate research being done to identify specifically how appropriate technologies and Internet connectivity can effectively contribute to development at local levels (2016b). ISOC similarly notes the need for sex-disaggregated data and to support policy research in order to better understand the barriers men and women face in Internet use (2016b).

Besides the need for more rigorous research, some contributors also express concern about the nature of some private initiatives to encourage connectivity and the need to ensure that such initiatives to expand access do not come at the cost of **net neutrality** and the **free flow of information**. The Diplo Foundation, for instance, argues that the use of drones, balloons and certain **zero-rating** practices have 'raised concerns about limiting access to a designated number of Internet platforms/services, which would accelerate a "walled garden" Internet' (2016). GSMA, on the other hand, argues that governments should consider supporting 'multi-sided business models as zero-rating and sponsored data' to enable, more particularly, successful rural infrastructure sharing

projects (2016a). Facebook similarly takes the view that zero-rating amounts to 'innovative business arrangements that promote connectivity and economic development' by giving 'more people more access to more content' (2016).

The APrIGF also points out that while 'ubiquitous technologies' like the **IoT** and the availability of fast broadband may support the development of new knowledge and information societies, they also create new digital divides 'as they skew benefits further towards those who already have access to the necessary skills and resources'. It consequently emphasises the need to take 'explicit measures' to 'support, conserve and enhance' users' 'individual and collective uniqueness, their language, geographic and cultural diversity' (2016a).

PART C

CONCLUSIONS AND NEXT STEPS

[To be addressed at IGF 2016 session, and updated thereafter]

APPENDICES

Appendix 1: Original contributions and background reading

All original contributions are also listed and uploaded in full to the IGF's website (submission tab).

Note that the acronym [OC] following a citation denotes an original contribution, including responses to the call for input that either contained generic comments or contained responses to the questions in the call for input are indicated. Background contributions, meaning contributions of existing reports or other background reading of potential significance to Phase II's work, are indicated with the acronym [BC].

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Final Draft

IGF 2016 COMMUNITY INTERSESSIONAL PROGRAMME

Policy Options for Connecting and Enabling the Next Billion – Phase II

v. 27 June 2016

MAG volunteers: Julian Casasbuenas G., Wisdom Donkor, Alejandra Erramuspe, Miguel Estrada, Segun Olugbile, Renata Aquino Ribeiro, Salanieta Tamanikaiwaimaro

Introduction

The 2012 report produced by the United Nations (UN) Commission on Science and Technology for Development (CSTD) working group on Internet Governance Forum (IGF) improvements called for the development of more tangible IGF outputs to "*enhance the impact of the IGF on global Internet governance and policy".* Given this, the IGF multi-stakeholder advisory group (MAG) launched a new intersessional programme in 2015 with the intent to extend and increase the impact of other IGF activities, such as NRIs, Dynamic Coalitions (DCs) and Best Practice Forums (BPFs).

Over 70 submissions, including 22 from national and regional IGFs, contributed to the development of a set of *Policy Options for Connecting the Next Billion* that were presented at IGF 2015 in João Pessoa, Brazil, in November 2015.

The outputs from this intersessional programme are intended to be a dynamic resource and evolve and grow over time. With this in mind, the MAG decided in April 2016 to explore further developing the IGF "*Policy Options for Connecting the Next Billion*", including an inclusive invitation to the NRIs for their contributions detailing certain national and regional specificities, including challenges and relevant developments.

Policy Options for Connecting the Next Billion – Phase II

The UN Agenda for Sustainable Development identifies information and communication technologies (ICTs) and the Internet as horizontal enablers for development. Paragraph 9-c. sets an important goal for the international community, namely to:

> **"***Significantly increase access to information and communications technology and strive to provide universal and affordable access to the Internet in least developed countries by 2020"*

Given ICTs and the Internet are so important to development, it is critical that policy options and strategies be tailored to local needs and specificities.

The first phase of the IGF intersessional project *Policy Options for Connecting the Next Billion* (2015) focused on developing a set of policy options aiming at the creation of enabling environments, including:

- Deploying **infrastructure;**
- Increasing **usability;**
- Enabling **users** (e.g. through ICT literacy and training tools); and
- Ensuring **affordability.**

In 2016, it is proposed to further develop these policy options by **emphasizing local and regional specificities:**

- For example: level of market and digital policies development, competition environment, capacity-building, technical infrastructure, access to information and content, cybersecurity, etc.
- The NRIs could be invited to contribute to identifying local challenges and to showcasing success stories.

With a view to **demonstrating how *Connecting and Enabling the Next Billion* contributes to reaching the new Sustainable Development Goals** (SDGs)

- While all of the SDGs are equally important to consider, some (like, for example, affordable connectivity and access to infrastructure, the cross-cutting use of ICT tools, digital literacy and skills, and capacity-building) can be viewed as building blocks to support other SDGs.

- Examples of success stories in using the Internet to address real world problems in least developed and developing countries should be inclusive of examples in e-government, e-agriculture, e-health, e-education, e-innovation and e-commerce; of how ICTs could be used to empower women and girls; the importance of the mobile industry to connectivity in developing regions; as well as other innovations in areas facing pandemics, such as use of high-speed Internet in fighting Ebola.

- Limitations, barriers to entry, and examples of what has not worked well would also be observed.

- As far as possible, tangible checklists could be developed to provide a framework of considerations for the implementation of each of the SDGs that potentially relate to connecting and enabling the next billion.

To enhance the impact of the IGF's work, it is also proposed to:

- **Build strategic alliances with key players at all levels**: global, regional, national, local: development workers and communities, World Bank, International Telecommunication Union (ITU), UN Educational, Scientific and Cultural Organization (UNESCO), UN Conference on Trade and Development (UNCTAD), CSTD, regional commissions, European Union (EU), African Union Commission, NEPAD, Institute of Electrical and Electronics Engineers (IEEE), Association for Progressive Communications (APC), Web Foundation, GSMA, LIRNE*asia*, other civil society organizations; International Chambers of Commerce (ICC), relevant ministries and national agencies of education and health, local governments, NGOs, etc.

- **Build strategic alliances with key non-governmental initiatives**: 2030 SDGs, Global Connect Initiative, Alliance for Affordable Internet, WEF Internet for All initiative, etc. The strategic alliance could also deal with innovative funding mechanisms.

Modality

- To identify policy options for "C*onnecting and Enabling the Next Billion – Phase II*", rounds of online public consultations will be conducted (with versions in local languages as far as is

reasonably possible). Following the example of the BPFs, an open and bottom-up process is envisioned to collect input.

- Initial contributions in Phase I will be analysed with the aim of identifying commonalities and differences across submissions. This should prevent the need for duplicate submissions by stakeholders, and will strengthen the current work.

- Interested NRIs, DCs, and BPFs will be invited, among others, to contribute by sharing success stories or by proposing additional options to support *Policy Options for Connecting and Enabling the Next Billion – Phase II*.

- Draft outputs will be produced and further discussed, both online and during the IGF 2016 (6-9 December, Jalisco, Guadalajara, Mexico) during a main session. Once compiled, the output will be made available to/shared with relevant fora at all levels, e.g. UN Technology Facilitation Mechanism, High-Level Political Forum, World Summit on the Information Society (WSIS) Forum, NRIs, DCs, BPFs, etc. This output will also serve as input to the IGF community in order to decide on a theme for the 2017 IGF community intersessional work.

Timeframe

- July – open-ended: Launch public call for background contributions on the theme of "*Policy Options for Connecting and Enabling the Next Billion – Phase II*". Contributions will be gathered and ultimately incorporated in the output through an iterative process.

- July: Invitation to the MAG/ IGF community to join open editorial group.

- Sept: First draft "*Policy Options for Connecting and Enabling the Next Billion – Phase II*" open for public comment through web platform and reviewed by open editorial group.

- Oct.: Second draft open for public comment through web platform.

- Nov.: Final draft output published on IGF website.

- Dec.: Presentation and discussion of the "*Policy Options for Connecting and Enabling the Next Billion – Phase II*" during IGF meeting.

- Post-IGF: "*Policy Options for Connecting and Enabling the Next Billion – Phase II*" incorporates input from IGF 2016 in Mexico; published and shared with relevant fora at the international, regional and local level. Documents/work space continue to evolve (based on support and value).

Appendix 3: Call for input

Policy Options for Connecting and Enabling the Next Billion – Phase II:

Call for Public Input

11 July 2016

Introduction

In 2015, over 70 submissions, including 22 from national and regional IGF initiatives (NRIs), contributed to the development of a set of *Policy Options for Connecting the Next Billion* that were presented at IGF 2015 in João Pessoa, Brazil, in November 2015.

The first phase of the IGF intersessional project *Policy Options for Connecting the Next Billion* (2015) focused on developing a set of policy options aiming at the creation of enabling environments, including deploying infrastructure, increasing usability, enabling users and ensuring affordability.

In April 2016, the MAG decided to explore further developing the IGF "*Policy Options for Connecting the Next Billion*".

Phase II (2016): Policy Options for Connecting and Enabling the Next Billion

The UN Agenda for Sustainable Development identifies information and communication technologies (ICTs) and the Internet as horizontal enablers for development. Paragraph 9-c. sets an important goal for the international community, namely to:

> "*Significantly increase access to information and communications technology and strive to provide universal and affordable access to the Internet in least developed countries by 2020"*

Given ICTs and the Internet are so important to development, it is critical that policy options and strategies be tailored to local needs and specificities. In 2016, it is proposed to further develop the 2015 *Policy Options* by emphasizing local and regional specificities and by demonstrating how *Connecting and Enabling the Next Billion* contributes to reaching the new Sustainable Development Goals (SDGs).

Learn more about this initiative

Read the full outline framework document, including a more detailed description, explanation of modalities, and timeline, here.

Guidelines for background contributions

All stakeholders are invited to submit contributions on the theme "*Policy Options for Connecting and Enabling the Next Billion*". Contributions from NRIs, best practice forums (BPFs), dynamic coalitions (DCs), and IGF workshops are particularly welcome.

What format should my feedback be in?

Contributions are preferred in Microsoft Word, but should as far as possible be supported by links to studies, reports, references, statistics, etc. and are expected to be of reasonable length in order to maximize readability. Additional templates may be developed to aid contributions if this is deemed helpful.

What will happen to my contribution?

All contributions will be published on the IGF's website and will be analysed and incorporated into the outcome document for *Policy Options for Connecting and Enabling the Next Billion*, as far as is deemed possible and relevant by the editorial group of volunteers. All contributors' details will be credited in the outcome document, and contributions may be published on the IGF's website.

What is the deadline for contributions?

While we would appreciate input by 31 July 2016, we will continue to receive contributions on a rolling basis until 31 August for the first draft.

To facilitate the participation of national and regional IGF initiatives (NRIs) that might only host their respective events later this year, no deadline has been prescribed for NRIs.

Who do I send my feedback to?

Email contributions should be sent to Anri van der Spuy (avanderspuy@unog.ch) and Brian Gutterman (gutterman@un.org).

What if I have more questions?

For further queries, or for more information, please contact Constance Bommelaer (bommelaer@isoc.org), the coordinator of this initiative.

Proposed questions to guide your response:

While inputs of any format will be considered for incorporation, a suggested format could include bullet points addressing some or all of the following questions:

1. How would you define, or how do you understand, the theme "*Connecting and Enabling the Next Billion*"?

2. The first phase of *Connecting and Enabling the Next Billion (2015)* identified a set of policy options aimed at the creation of enabling environments, including deploying infrastructure, increasing usability, enabling users, and ensuring affordability. What are the factors to consider when adopting these policy options at local levels (e.g. the state of a country's market development, the available infrastructure, level of capacity-building, etc.)?

3. Are you aware of any specificities around connectivity at a local or regional level? (In other words, do you know of factors that impact connectivity in, for instance, rural areas but less so at an urban level? Or factors that affect connectivity at regional or larger scale, but not as noticeably at local or smaller scale?)

4. Data shows that the growth of Internet adoption is slowing down in some areas, especially as broadband services extend to more remote, less densely populated areas (facing challenges beyond affordability and availability).[6] What are some of the barriers or limitations preventing people who *do* have Internet access from being enabled or empowered through such connectivity?

5. What does *meaningful access* mean?

[6] Broadband Commission (2015). *The State of Broadband 2015.* Available online: http://www.broadbandcommission.org/documents/reports/bb-annualreport2015.pdf.

6. How can connectivity contribute to reaching the new SDGs?

7. Do you know examples of stories where using ICTs to support development has not worked, and why?

8. Can you think of ways in which ICTs or Internet connectivity could be used to help reach the SDGs?

9. Do you know of examples of success stories that can illustrate how Internet access can help to address real-world problems (in either developed or developing countries)? For example, do you have stories or experiences to share regarding some or all of the following SDG-related questions:

    - How can connecting and enabling users help **to reduce poverty** in its various forms? (SDG 1)
    - How can connecting and enabling users help to **end hunger, achieve food security and support improved nutrition**? (SDG 2)
    - How can connecting and enabling users help to **promote sustainable agriculture**? (SDG 2)
    - How can connecting and enabling users help to ensure **healthy lives** and to promote **well-being** at all ages? (SDG 3)
    - How can connecting and enabling users help to ensure inclusive and equitable, quality **education**? (SDG 4)
    - How can connecting and enabling users help to promote lifelong **learning opportunities**? (SDG 4)
    - How can connecting and enabling users help to achieve **gender equality**? (SDG 5)
    - How can connecting and enabling users help to **empower women and girls**? (SDG 5)
    - How can connecting and enabling users help to ensure the availability and sustainable management of **water and sanitation**? (SDG 6)
    - How can connecting and enabling users help to ensure access to affordable, reliable, sustainable and modern **energy**? (SDG 7)

- How can connecting and enabling users help to promote sustained, inclusive and sustainable **economic growth**? (SDG 8)
- How can connecting and enabling users help to promote full and **productive employment**? (SDG 8)
- How can connecting and enabling users help to ensure **decent work**? (SDG 8)
- How can connecting and enabling users help to build resilient **infrastructure**, promote inclusive and sustainable **industrialization** and foster **innovation**? (SDG 9)
- How can connecting and enabling users help to **reduce inequality** within and among countries? (SDG 10)
- How can connecting and enabling users help to make **cities** and human **settlements** inclusive, safe, resilient and sustainable? (SDG 11)
- How can connecting and enabling users help to ensure sustainable **consumption and production** patterns? (SDG 12)
- How can connecting and enabling users help to combat **climate change** and its impacts? (SDG 13)
- How can connecting and enabling users help to conserve and sustainably use the **oceans**, **seas** and **marine resources** for sustainable development? (SDG 14)
- How can connecting and enabling users help to protect, restore and promote sustainable use of **terrestrial ecosystems**, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss? (SDG 15)
- How can connecting and enabling users help to **promote peaceful and inclusive societies** for sustainable development? (SDG 16)
- How can connecting and enabling users help to provide access to **justice** for all? (SDG 16)
- How can connecting and enabling users help to build effective, accountable and inclusive **institutions** at all levels? (SDG 16)

- How can connecting and enabling users help to strengthen the means of **implementation** (SDG 17)
- How can connecting and enabling users help to revitalize the **global partnership** for sustainable development? (SDG 17)