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UNESCO'S Internet Universality Indicators: A Framework for Assessing Internet Development

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Foreword

Have you ever wanted to gain a deeper understanding of the complexities of the digital environment? To have a map of the Internet measuring its compliance with human rights, evaluating its openness and accessibility, and assessing the involvement of different actors and communities in its governance? If so, UNESCO's Internet Universality Indicators are for you.

In the 21st century, digital technologies offer unprecedented opportunities for access to information, freedom of expression, human connectivity, technological innovations, as well as multistakeholder engagement. At the same time, they pose major challenges, especially with regards to free expression, privacy, online disinformation, the safety of journalists, transparency, accountability, deepening inequalities, gender and other divides.

For this reason, UNESCO has developed the Internet Universality Indicators (IUIs), an innovative tool to support our Member States and all interested stakeholders. The Indicators enable everyone to voluntarily assess their national Internet environment, address digital gaps, and improve the Internet.

The Internet Universality Indicators are linked to the very heart of UNESCO's mandate to "promote the free flow of ideas by word and image" and build inclusive Knowledge Societies. This new and unique resource can strengthen the Internet's role in achieving the United Nations Sustainable Development Goals by 2030.

The framework helps to operationalise the concept of 'Internet Universality' adopted by UNESCO in 2015, by enabling a practical assessment of the Internet following the ROAM principles which advocate for an Internet that is based on human Rights, that is Open and Accessible to all, and nurtured by Multistakeholder participation. The results of a research based on these Indicators can highlight gaps and inform recommendations for targeted improvement.

The Indicators were developed through a global, innovative, open, and inclusive multistakeholder consultation both online and offline. From March 2017 to September 2018, 46 consultation events were organized in 36 countries, covering all regions of the world. 66 Member States contributed to the elaboration of the indicators. More than 300 submissions were also received on a dedicated platform[1]. In total, over 2000 experts have engaged with UNESCO in developing the Internet indicators.

This new tool has already started to generate a significant impact. In July 2018, it was highlighted in the UN Human Rights Council Resolution on the promotion, protection and enjoyment of human rights on the Internet.

The final IUIs framework contains 303 indicators, including 109 core indicators, distributed under six categories, 25 themes, and 124 questions. Besides the four ROAM categories, 79 cross-cutting indicators address issues related to gender equality and the needs of children and young people, sustainable development, trust and security, as well as legal and ethical aspects of the Internet.

By measuring the crosscutting role and transformative power of the Internet and ICTs, the Internet Universality Indicators framework clearly contributes to the achievement of the 2030 Sustainable Development Agenda. Amongst many other points relevant to UNESCO's work, the framework covers key aspects of the UN's Sustainable Development Goal 16.10 which calls for public access to information and fundamental freedoms. In this way, the Indicators can contribute to achieving key objectives that substantially impact other Sustainable Development Goals – ranging from ending poverty and countering climate change to advancing gender equality.

1 UNESCO's Internet Universality Indicators Platform. https://en.unesco.org/internetuniversality

The Internet Indicators also assess a wide range of issues related to freedom of expression and media development, thus updating and complementing UNESCO's Media Development Indicators, Journalists' Safety Indicators, and Gender-Sensitive Indicators for Media.

The Indicators were recognised in November 2018 at the 31st Session of UNESCO's Intergovernmental Council of the International Programme for the Development of Communication (IPDC). The IPDC "welcomed the Internet Universality Indicators framework" and "endorsed the use of this tool on a voluntary basis as a useful resource available for Member States."[2]

Since the value of using this tool is recognized internationally, we encourage its uptake and application. We especially encourage cooperation between authorities, civil society, the technical community, the private sector, academia, and the journalism and media community. They can all benefit from coming together to voluntarily conduct national assessments of Internet development and maybe feed their findings into evidence-based policy.

We thank all those involved in the consultation process to develop these indicators, especially the Kingdom of Sweden, the Internet Society (ISOC), the Internet Corporation for Assigned Names and Numbers (ICANN), the Brazilian Network Information Center (NIC.br) and the Latin America and Caribbean Network Information Centre (LACNIC).

We hope that these Internet Universality Indicators will help to reinforce the values of a universal Internet, respectful of human rights, freedom of expression, privacy and the right to participate in public life. This should be a transparent, technologically neutral, accessible, and affordable Internet. It should be one that connects people together, that is inclusive and embraces diversities, that empowers individuals from all genders, ages, races, cultures, and social backgrounds. That is the Internet we want, and need to achieve Sustainable Development.

These Internet Universality Indicators were developed for you. We invite you to adopt and adapt them, to assume ownership of the tool and use it for research, dialogue and improvements in your country.

Let's work together and leave no one behind in the digital age.

Moez Chakchouk

Assistant Director-General for Communication and Information

UNESCO

2 Decisions taken by the 31st Council Session of the International Programme for the Development of Communication (IPDC), 21-22 November 2018, UNESCO HQ. https://unesdoc.unesco.org/ark:/48223/pf0000266235

Acknowledgments

UNESCO would like to thank the Swedish International Development Agency (Sida), the Internet Society (ISOC), the Internet Corporation for Assigned Names and Numbers (ICANN), as well as the Brazilian Network Information Center (NIC.br), and the Latin America and Caribbean Network Information Centre (LACNIC) for their essential support to the project.

UNESCO also thanks all UNESCO Member States which have participated in and contributed to the consultation process. In this regard, we would also like to highlight the contribution of the Freedom Online Coalition as well as the involvement of members of UNESCO's IPDC Council.

We would also like to thank all the participants and contributors of the online consultation, all the speakers and audience members of our consultative meetings, as well as all national, regional, and international platforms which have hosted our workshops and have invited us to their events.

Advice has been garnered during the project from a Multistakeholder Advisory Board made of 15 international experts and the Organisation for Cooperation and Economic Development (OECD). UNESCO thanks them for their guidance.

For UNESCO-wide teamwork, we would like to thank all UNESCO colleagues from the Communication and Information Sector, the Culture Sector, the Education Sector, the Social and Human Sciences Sector, the Division for Gender Equality, UNESCO's Institute for Statistics (UIS), the UNESCO Institute for Information Technologies in Education (IITE), as well as UNESCO's Field Offices in Montevideo, Bangkok and Beijing for their strong contribution to the development of the indicators.

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UNESCO would like to acknowledge the professional collaboration with a research consortium led by the Association for Progressive Communications (APC) and made up of ict Development Associates (ictDA), LIRNEasia, and Research ICT Africa (RIA), who have helped us to develop the framework of indicators. We thank David Souter and Anri van der Spuy, as the leading authors of the publication, as well as Anriette Esterhuysen for the excellent coordination of the consortium that helped UNESCO conduct global consultations on this Framework.

Contents

Abbreviations and Acronyms

APC	Association for Progressive Communications
API	Application Programming Interface(s)
APNIC	Regional Internet address Registry for the Asia-Pacific
ccTLDs	Country Code Top-Level Domain
CEDAW	Convention on the Elimination of Discrimination against Women
CERT	Computer Emergency Response Team
CRC	Convention on the Rights of the Child
DNSSEC	Domain Name System Security Extensions
FOSS	Free and Open-Source Software
GAC	ICANN's Governmental Advisory Committee
GDP	Gross Domestic Product
GNI	Gross National Income
GSMA	Groupe Spéciale Mobile Association
gTLDs	Generic Top-Level Domains
HDI	Human Development Index (UNDP)
ICANN	Internet Corporation for Assigned Names and Numbers
ICCPR	International Covenant on Civil and Political Rights
ICERD	Conventions on the Elimination of All Forms of Racial Discrimination
ICESCR	Economic Social and Cultural Rights
ICT	Information and Communications Technology (or technologies)
IDN ccTLDs	Internationalized Country Code Top-Level Domain
IGF	Internet Governance Forum
IPDC	International Programme for the Development of Communication (UNESCO)
IPv4	Internet Protocol Version 4
IPv6	Internet Protocol Version 6
ISPs	Internet Service Provider

ITU	International Telecommunication Union
IXPs	Internet Exchange Points
LDCs	Least Developed Countries
MDIs	Media Development Indicators
NGOs	Non-Profit Organization
OECD	Organisation for Economic Cooperation and Development
OER	Open Educational Resources
RIA	Research ICT Africa
ROAM	Rights, Openness, Accessibility, Multistakeholder (UNESCO)
SDGs	Sustainable Development Goals (United Nations)
SIDA	Swedish International Development Agency
SIDS	Small Island Developing States
SMEs	Micro, Small and Medium-Sized Enterprises
STEM	Science, Technology, Engineering, and Mathematics
UDHR	Universal Declaration of Human Rights
UIS	UNESCO Institute for Statistics
UN DESA	United Nations Department of Economic and Social Affairs
UN HRC	United Nations Human Rights Council
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNGA	United Nations General Assembly
UNODC	United Nations Office on Drugs and Crime
VPNs	Virtual Private Network(s)
WHO	World Health Organisation
WSIS	World Summit on the Information Society

Executive Summary

The Internet has developed rapidly into a communications medium which continues to transform access to information, opportunities for expression, and many aspects of government and business for people around the world. It has become a global marketplace for ideas, goods and services. It has both facilitated the enjoyment of human rights and raised new risks. Among the challenges that need to be addressed if the benefits of the Internet are to be universally available, are digital divides between developed, developing and least developed countries, between urban and rural areas within countries, between people with higher and lower incomes and higher and lower levels of educational experience and attainment, and between women and men. Opportunities and risks will continue to become more complex, more powerful and more influential on the future as a result of the Internet's technology, services and markets are in constant change.

Understanding and assessing the complexity of the Internet's development, and its impact is crucial if we are to effectively address the Internet for optimum contribution to the Sustainable Development Goals (SDGs). UNESCO has long engaged with this agenda, emphasising the Internet's potential for developing Knowledge Societies, based on freedom of expression, universal access to information and knowledge, respect for cultural and linguistic diversity, and quality education for all. For example, the Organisation played a prominent part in the World Summit on the Information Society (WSIS, 2003 and 2005) and has continued to play an important role in Internet Governance Forum (IGF), the Broadband Commission on Sustainable Development and other fora concerning the Internet and its impact. As the Internet has continued evolving, so UNESCO has developed the concept of Internet Universality in order to help comprehend the developments.

Internet Universality

The Internet is much more than digital technology; it is also a network of economic and social interactions and relationships. As such, this has shown potential to enable human rights, empower individuals and communities, and facilitate sustainable development. It has also presented challenges to established norms in ways that can have both positive and negative impacts on economic, social and developmental outcomes. How the range of Internet issues are integrated within public policy affects matters like equality, inclusiveness, media and journalism, cultural diversity, quality education for all, and the protection of human rights. These impacts are all relevant to UNESCO's mandate, and they are part of the complex Internet environment that can be profitably explored and enhanced through the prism of Internet Universality.

After a two-year process of evolution, this concept of Internet Universality was endorsed by UNESCO's General Conference in 2015. The concept sets out a vision which highlights four principles that serve as the key pillars underpinning the growth and evolution of the Internet, and it points to the need to strengthen these as the Internet becomes more pervasive in human affairs. Understanding the Internet in this way helps to draw together different facets of its ecosystem which are relevant to UNESCO's role in the world and the Organisation's support for its Member States.

The four principles identified as key to Internet Universality are summarised as the R-O-A-M principles, and are fundamental to the development of the Internet in ways that are conducive to achieving the Sustainable Development Goals with no one left behind. These principles are:

R – that the internet is based on human **Rights**

O – that it is **Open**

A – that it should be **Accessible to all**, and

M – that it is nurtured by **Multistakeholder participation.**

To enable the concept of Internet Universality to be more concretely understood and applied, UNESCO has spent two years developing indicators for the four principles. These indicators enable the empirical assessment of Internet Universality in terms of its existence at the level of a national Internet environment. By using these new indicators for research, a collage of evidence can be assembled to help governments and other stakeholders to identify achievements and gaps. The indicator framework is tailored for national use in regard to improving the local Internet environment, and is not designed or suited to rank countries in comparison with one another.

A process of desk research, expert consultation internationally, and field testing in a range of countries, lies behind the Internet Universality indicators that are set out in this document. This work was undertaken by UNESCO with the support of a consortium led by the Association for Progressive Communications (APC) and including ict Development Associates, LIRNEasia and Research ICT Africa.

The first round of consultation was concerned with the broad themes of Internet Universality and the ways in which they might be encapsulated in an indicator framework. An online consultation was held between June and October 2017 and attracted 198 contributions. Consultative meetings and workshops were also held at 26 international, regional and national events between March and October 2017.

A second round of consultation, held along similar lines between December 2017 and March 2018, invited contributions and comments on a draft indicator framework and set of indicators. This attracted 138 contributions, while additional consultative meetings and workshops were held at a further 15 international, regional and national events.

In a third phase, the indicators which emerged from these consultation processes were then further refined and put to the test through scientific screening or pre-testing in four countries – Brazil, Ecuador, Nigeria and Pakistan. This was followed by another refinement exercise as a prelude to part-piloting exercises in three countries – Brazil, Senegal and Thailand. The result of this experience enabled a final improvement of the indicators, with the results contained in this document.

Advice from a Multistakeholder Advisory Board, the UNESCO Institute for Statistics (UIS) and the Organisation for Cooperation and Economic Development (OECD) has been garnered during the project. Financial support has come from the Swedish International Development Agency, the Internet Society and ICANN.

The result of the development process has constituted an up-to-date, holistic, and road-tested research instrument, drawing from key insights and experiences gained across the world and across stakeholder groups.

The Indicator Framework

The Internet Universality indicator framework is structured around the four ROAM Principles, with the addition of Cross-Cutting Indicators concerned with gender and the needs of children, sustainable development, trust and security, and legal and ethical aspects of the Internet. Together, these form the "ROAMX" indicator framework.

In addition to the ROAMX indicators, the framework provides a number of contextual indicators concerned with a country's demographic, social and economic characteristics. These contextual indicators are intended to help users to understand their findings in the most appropriate way for different countries.

Themes, Questions and Indicators

Each of the ROAMX categories is divided into a number of themes. These themes form the basic structure for research and assessments to be made using the indicators.

Within each theme, a number of questions are identified, and each question is associated with one or more indicators.

Implementation of the Indicators

It is recognised that evidence may not be available for all indicators in any given country. However, the number and range of indicators provides that researchers should nevertheless be able to gather sufficient data for a substantive assessment to be made in spite of data limitations. Further, to help interpret the indicators and find appropriate information for them, the framework provides generic sources of quantitative and qualitative evidence, relevant background documentation, and established international indices as well as other indicator frameworks that may be of value.

UNESCO hopes that the indicator framework will be used as a whole by interested parties, but also recognises that this can require significant resources in research time and expertise. A shorter selective set of core indicators has therefore also been identified (Annex 4). These core indicators have been taken entirely from the full framework.

An Implementation Guide (Chapter 10) for researchers accompanies this framework document, providing technical guidance and advice on the research process.

Because the Internet is changing very fast, UNESCO will seek to review the indicator framework five years after adoption and at five-yearly intervals thereafter. Such a review will also draw on the experiences and lessons learnt of assessments conducted and completed.

Based on this explanation of the genesis, role and future for the Internet Universality indicators, UNESCO is confident that this quality research tool will be of great value for any interested Member State that is seeking to map relevant Internet issues in its national space. The findings of such an assessment of Internet Universality at national level can feed into evidence-based policy to improve the contribution of the Internet to achieving sustainable development in the country concerned.

1

UNESCO's Internet Universality **Indicators Project**

Info Lady Shathi shows videos to a group of women in a rural village. In Bangladesh, the Info Ladies are bringing Internet services to men and women who need information but don't have the means to access the web. After three months of training, the Info Ladies set out each day in their pink and blue uniforms to cycle to remote villages where they provide connection to villagers who want to communicate with relatives working overseas.

The Evolving Internet

1

The Internet is still a relatively recent development in communications. From its first beginnings, when it provided robust communications links for small groups of scientists and researchers, it has developed into a multidimensional communications medium that can be difficult to comprehend holistically. The Internet is also increasing the wider ecosystem of media and communications development, as well as a global marketplace for ideas, goods and services. It has both facilitated the enjoyment of human rights and posed new risks to that enjoyment. The complexity of the Internet can inhibit our understanding of, and our ability to shape, the ways in which it is transforming access to information, opportunities for expression, as well as government and business. Understanding and assessing Internet development, and its impact on emerging Knowledge Societies as foundations for achieving sustainable development, becomes increasingly more important.

Change is linked to the Internet's open architecture which has facilitated innovation. New developments in technology, access devices and services continually create new opportunities for individuals, governments and businesses. The most significant of these developments include the creation of the World Wide Web, the emergence of the mobile Internet and development of smartphones, and the growth of social media. Continual growth in bandwidth has enabled much higher volumes of Internet traffic, facilitating the development of cloud computing and the growth of services such as video streaming. Further Internet-enabled innovations and related digital developments, including the Internet of Things, artificial intelligence and algorithmic decision-making, will continue to alter the nature of the Internet and its impact on economies and societies, including on the United Nations' the Sustainable Development Goals (SDGs). Our understanding of the Internet must evolve alongside its changing technology and services, and interdependent components.

The SDGs stress that no one should be left behind. Inclusiveness remains a major concern of international discourse on the Internet, dating back to its early days. Some regions, countries, communities and individuals have been better placed than others to take advantage of its opportunities. There are pronounced digital divides between developed, developing and least developed countries, between urban and rural areas within countries, between people with different incomes and levels of educational experience and attainment, and between women and men. Young people have generally higher rates of Internet participation than older people, while some social groups, such as persons with disabilities, have lower participation rates. UNESCO shares the concern of other stakeholders to ensure accessibility for all, as a condition for the universality of the Internet.

As the Internet has become more pervasive, policymakers and the technical community have had to address not just opportunities, but also risks associated with it. Cybersecurity, used in a broad sense here, is concerned with the integrity of the network as well as the protection of Internet users against fraud and other types of criminality. Other concerns which have become prominent in Internet debates include privacy and data protection, incitement to violence and discrimination, personal abuse, the use of social media to mislead as well as to inform, and child protection. These issues, which have both legal and ethical dimensions, are also important aspects of the Internet environment.

UNESCO has been engaged with this agenda for many years, emphasising the Internet's potential within its goal of developing Knowledge Societies,[1] based on freedom of expression, universal access to information and knowledge, respect for cultural and linguistic diversity, and quality education for all. The Organisation played a key role in the World Summit on the Information Society (WSIS, 2003 and 2005), which mapped out the implications of information technology for development, including the Internet, and reinforced multistakeholder approaches in Internet governance.[2] UNESCO has played a significant part in the WSIS Action Lines and the annual WSIS Forum over the years, as well as in its participation in the Internet Governance Forum. The Organisation has also convened a series of conferences and other events on Internet developments, and published many reports and analyses of the Internet's impact on different aspects of its mandate. The Internet is central to the work of UNESCO's Communication and Information Sector, as well as to its work in education, culture, natural and social science.[3]

UNESCO sees the Internet as much more than an aggregation of infrastructure, devices and applications. It recognises that this is also a network of economic and social interactions and relationships, reaching far beyond technology, with great potential to enable human rights, empower individuals and communities, and facilitate sustainable development. The Internet raises challenges to established economic and social norms with both positive and negative impacts on economic, social and developmental outcomes. The ways in which it is integrated within public policy and practice impact upon equality, inclusiveness and the protection of human rights, as well as on media, cultural diversity, quality education for all and other UNESCO concerns. All these aspects of the complex Internet environment can be explored and enhanced through the prism of Internet Universality.

Internet Universality Concept

UNESCO launched the concept of Internet Universality in 2013 as a way to identify features of the internet that are fundamental to fulfilling the potential of this human creation for the building of knowledge societies and achieving sustainable development.[4]

The concept of Internet Universality was elaborated by UNESCO through an extensive programme of research, analysis and consultation with Member States and the Internet stakeholder community. This included a multistakeholder conference, *CONNECTing the Dots*,[5] held in Paris in March 2015, and the publication of the expert report *Keystones to foster inclusive Knowledge Societies*.[6]

The concept of Internet Universality was then endorsed by UNESCO's General Conference in 2015[1]. It serves as a heuristic for approaching Internet-related issues and their relevance to our aspirations for sustainable development. The concept highlights four principles that serve as the key pillars underpinning the growth and evolution of the Internet, and it points to the need to strengthen these as the Internet becomes more pervasive in all dimensions of life.

Understanding the internet in this way helps to draw together different facets of its ecosystem which are relevant to UNESCO's mandate in the world, and which shape the intersection of technology, public policy, human rights and sustainable development.

The four principles embraced by Internet Universality –known as the R-O-A-M principles – are seen as fundamental to the development of the Internet in ways that are conducive to achieving the Sustainable Development Goals. These principles are:

R – that the internet be based on human **Rights**

O – that it is **Open**

A – that it should be **Accessible to all**, and

M – that it is nurtured by **Multistakeholder participation**.

Internet Universality as a concept emphasises the importance of understanding the development of the Internet holistically, including the interaction between these four principles. This holistic approach to the Internet can enrich discussion about the role which it can play in facilitating achievement of the United Nations' *2030 Agenda for Sustainable Development*.[7]

While the concept of Internet Universality and the indicators framework set out in this document primarily concern the Internet, they are also appropriate and applicable to other, wider aspects of the rapidly evolving digital environment. The pace of change in information technology and services and the emergence of new technologies such as artificial intelligence and advanced robotics require continual review of mechanisms

1 Outcome document of the "CONNECTing the Dots: Options for Future Action" Conference. 38C/53 (2015). http://unesdoc.unesco.org/images/0023/002340/234090e.pdf

designed to foster opportunities and mitigate risks arising from them. The four principles and the direction in which they point provide insights into the evolution of humanity and digital developments more broadly.

Why Internet Universality Indicators?

It is to enable more concrete analysis of the Internet Universality concept at country level that a research framework of indicators has been developed. The purpose of this framework of Internet Universality indicators is to assist interested governments and other stakeholders who seek to voluntarily assess their national Internet environments as a means towards enabling evidence-based policy formulation.

This development of Internet Universality indicators has been undertaken on mandates from the UNESCO General Conference and from the intergovernmental Council of the International Programme for the Development of Communication (IPDC).[2] Further mandates concerning the development of Internet Universality indicators include the 39 C/5 programme adopted by the 2017 General Conference of UNESCO. The IPDC Bureau in 2016 also approved a funds in trust project supported by the Swedish International Development Agency (SIDA) to support a global consultation as part of the development process. In addition to this support, resources have also been mobilised from the Internet Society and ICANN to support this work.

The indicators are comparable to the *Media Development Indicators* (MDIs) which were adopted by the IPDC in 2008 and are intended for use by governments and other stakeholders (from any group or sector) where interested, and where resources can be mobilised to undertake national assessments. By mid 2018, almost 30 MDIs had been completed or were underway in different countries, thereby enriching knowledge and understanding of national media landscapes. While the MDI framework continues to be relevant, the Internet Universality framework is a complementary research tool to provide a mapping of the broader ecosystem in which media institutions exist and of other evolving dimensions of the communications ecosystem that impact on the range of UNESCO concerns.

The Internet Universality indicators which are set out in this document draw on UNESCO's previous experience with indicator frameworks concerned with media and communications. Besides the MDIs adopted at the 26th session of the IPDC in 2008,[8] and subsequently used in a number of Member States around the world,[9] there are also other indicator frameworks which are used, voluntarily, by interested Member States and other stakeholders to assess aspects of the communications environments in their countries and develop policy approaches to enhance the quality of those environments:

- IPDC adopted indicators for assessing the safety of journalists in 2013.[10]
- *Gender-sensitive Indicators for Media* were put in place in 2012.[11]
- Indicators concerned with media and information literacy have also been published.[12]

Where appropriate, the framework set out in this document makes use of these existing documents.

The indicators in this document follow work that has been undertaken to implement these mandates. It is hoped that the indicator framework set out in this document will complement efforts by United Nations and other stakeholders to monitor and measure implementation and achievement of the SDGs, including the work of the Task Group on ICT Indicators for the SDGs which has been established by the Partnership on Measuring ICT for Development.[13]

2 The possibility of developing indicators to assess the Internet from a UNESCO point of view was signalled in November 2014 at the 29th session of the intergovernmental council of UNESCO's International Programme for the Development of Communication (IPDC). This authorised 'continued work in standard setting through the elaboration and application of indicators relevant to media development', building on experience with the MDIs. The outcome document from the ***CONNECTing the Dots*** conference in 2015, which presented the concept of Internet Universality, and which was endorsed by the General Conference, also called for 'further research' to be undertaken into 'law, policy, regulatory frameworks and the use of the Internet, including relevant indicators'.

Methodology and Development Process of the Indicator Framework

In April 2017, a consortium led by the Association for Progressive Communications (APC) was appointed through a global competitive tendering process to undertake work with UNESCO on the development of the Indicators. In addition to APC, this consortium included *ict* Development Associates and two regional ICT research institutes LIRNEasia and Research ICT Africa. Research for the project was led by Dr David Souter of ict Development Associates, supported by Ms Anri van der Spuy. The project team was coordinated by Ms Anriette Esterhuysen.

UNESCO appointed a Multistakeholder Advisory Board, made up of fifteen international experts in different aspects of the Internet, from different regions and stakeholder communities, to advise on implementation of the project (See Annex 1). Additional support and advice have been provided by the UNESCO Institute for Statistics. Advice was sought and received from the Organisation for Economic Cooperation and Development (OECD).

The project has been developed through three phases of research, consultation and validation.

The first phase was concerned with the broad themes of Internet Universality and the ways in which they might be encapsulated in an indicator framework. It included two elements:

a. Desk research into existing indicators and indices which have been developed or adopted by intergovernmental organisations, international NGOs and other stakeholders.
b. Consultation with the diverse stakeholder communities that are concerned with the Internet. The governments of Member States, international organisations and associations with particular interest in the Internet were explicitly invited to participate in this consultation.

The consultation process had two elements:

a. An online consultation, in the six official UN languages, was launched at the WSIS Forum on 14 June 2017 and remained open until 31 October 2017. This attracted 198 contributions (See Annex 3).3
b. Consultative meetings and workshops were held at 26 international, regional and national events concerned with the Internet, in 22 countries,4 between 29 March and 31 October 2017 (See Annex 2).

This first phase of work enabled the preparation of a draft indicator framework and set of indicators which were set out in the document Defining Internet Universality Indicators, published online and offline in December 2017. Six main criteria, drawn from UNESCO's previous experience with indicators, were considered in this work:

- that indicators should be chosen where measurement data are sufficiently reliable in quality to permit confident interpretation;
- that the selected indicators should be quantitative where possible and qualitative where appropriate;
- that they should be independently verifiable where possible;
- that they should, where possible and relevant, permit disaggregation by sex, age group, locality5 and other population characteristics;

3 This process built on exploratory work in 2014 led by Mr. Andrew Puddephatt, with support from the Internet Society. http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/CI/CI/pdf/news/defining_internet_indicators_draft.pdf

4 Argentina, Austria, Belgium, China, Colombia, Estonia, France, Germany, Indonesia, Jamaica, Jordan, Kenya, Panama, Peru, Portugal, Russia, South Africa, Sweden, Switzerland, Thailand, the United Arab Emirates and Vietnam.

5 *e.g.* the distinction between rural and urban areas.

- and that it should be possible for the necessary data or information to be gathered, at reasonable cost in time and money, in the majority of countries.

A second consultation process was held from 1 December 2017 to 18 May 2018, enabling all stakeholders to respond to this framework and draft indicators. The governments of Member States, international organisations and associations with particular interest in the Internet were again explicitly invited to participate.

Stakeholders were invited, in this second consultation, to address three questions:

1. *Are there any* **additional themes, questions or indicators** *which you believe should be included in the framework?*
2. *Are there any suggestions that you wish to make in respect of the* **proposed themes, questions and indicators** *which are included in the framework as it stands?*
3. *What* **sources and means of verification** *would you recommend, from your experience, in relation to any of the questions and indicators that have been proposed?*

As in the first phase, this second phase included:

a. An online consultation in six languages, which received 138 contributions (See Annex 3).
b. Consultative meetings and workshops at 15 international, regional and national events which were held in 13 countries between 1 December 2017 and 18 May 2018.6 These included regional consultation events in the Asia-Pacific, Africa, Latin America and the Caribbean, and Arab States regions (See Annex 2).

The draft indicators were revised in light of contributions made to this consultation process. The third phase of work comprised scientific assessments of the feasibility of revised draft indicators which were undertaken in four countries – Brazil, Ecuador, Nigeria and Pakistan – during May 2018. These assessed the viability of obtaining evidence to assess each of the indicators included in the framework and considered ways of implementing the framework in pilot countries.

Part-pilots of the indicators, exploring actual evidence, were undertaken in Brazil, Senegal and Thailand between July and September 2018.

On 21 November 2018, the 31st Session of UNESCO's Intergovernmental Council of the International Programme for Development of Communication (IPDC) "welcomed the Internet Universality indicators framework" and "endorsed the use of this tool on a voluntary basis as a useful resource available for Member States."[7] The Council also "encouraged interested Member States and all stakeholders, on voluntary basis, to support and conduct national assessments of Internet development with the Internet Universality indicators," and "to use the research findings for evidence-based policy discussions and recommendations."

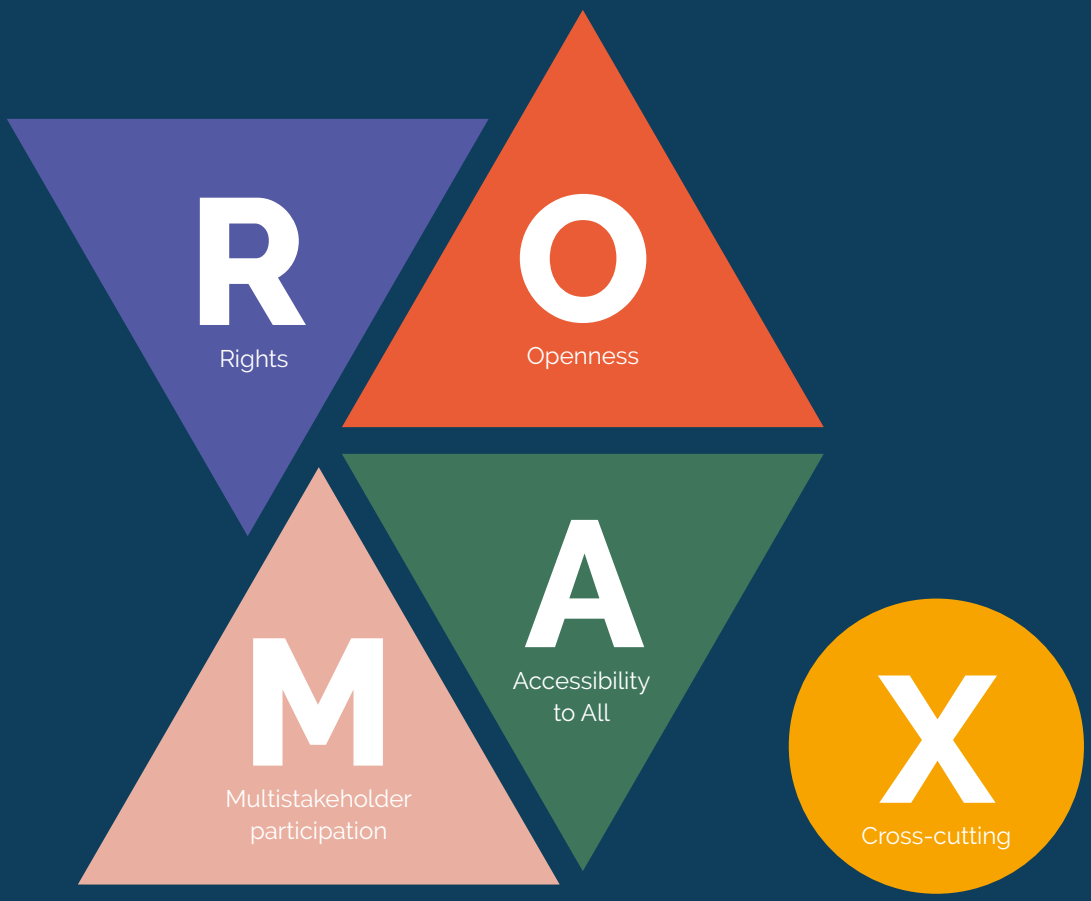
6 Brazil, Canada, Egypt, France, Ghana, Italy, Peru, Sri Lanka, Switzerland, Thailand, Tunisia, the United Kingdom, and the United States of America.

7 Decisions taken by the 31st Council Session of the International Programme for the Development of Communication (IPDC), 21-22 November 2018, UNESCO HQ. https://unesdoc.unesco.org/ark:/48223/pf0000266235

2

The Indicator **Framework**

Locals from Sanikiluaq, Nunavut, Canada take part in a digital mapping activity in 2015 to document their distinctive place-based knowledge, traditions, histories, and cultural practices. In collaboration between Indigenous communities, cartographers, and Google, the project aims to empower the 1.4 million people who self-identity as First Nations, Métis or Inuit in Canada with the ability to map territories and reflect their own communities.



ROAM-X INDICATORS

Introduction

The indicator framework which is set out in this document is intended to help governments and other stakeholders to assess their national Internet environments, identify areas in which improvements in policy and practice could enhance those environments and their alignment with the ROAM principles, and develop appropriate policy approaches and improvements in implementation in the light of that analysis. While the indicators are appropriate in all Internet environments, their application will vary between countries according to those countries' different circumstances.

The framework is not intended either to provide a basis for scoring national performance or to make comparisons between countries. Instead, it has been designed to be used by diverse national stakeholders, including governments, industry, civil society organisations, academia and other multistakeholder groups concerned with Internet development, access and rights.

The Structure of the Framework

The Internet Universality Indicators framework is structured around the four ROAM Principles, with the addition of Cross-Cutting Indicators concerned with gender and the needs of children, sustainable development, trust and security, and legal and ethical aspects of the Internet. Together, these form the ROAMX indicator framework.

In addition to the ROAMX indicators, this document identifies a number of contextual indicators concerned with the demographic, social and economic characteristics of a country, which are intended to help users to understand their findings in terms of conditions in their country.

Categories. The framework as a whole is structured around five categories, which include the four ROAM principles together with a category of Cross-Cutting Indicators (X).

Themes. Each of the ROAMX indicators is divided into a number of themes. There are six themes in the R and A categories, five themes in the O and X categories, and three themes in the M category.

Questions. A number of questions are set out within each theme. These address the specific points on which national performance is to be assessed and on which evidence is to be gathered and assessed. UNESCO has drawn extensively on contributions and suggestions made during the consultation process in selecting the questions and indicators on the basis of experience with other frameworks. Six criteria have also been used to support the selection of indicators:

- that each question and associated indicators should address a single issue;
- that indicators should be chosen where measurement data are sufficiently reliable in quality to permit confident interpretation;
- that the selected indicators should be quantitative where possible and qualitative where appropriate;
- that they should be independently verifiable where possible;
- that they should, where possible and relevant, permit disaggregation by sex, age group, locality and other population characteristics;
- and that it should be possible for the necessary data or information to be gathered, at reasonable cost in time and money, in the majority of countries.

Indicators. One or more indicators is/are identified for each question. These indicators provide the evidence base for assessment of the question. These indicators fall into three categories:

- quantitative indicators, which use data derived from official statistics and other data sources where these are available, including household and other professionally-conducted quantitative surveys, private sector data gathered by Internet businesses where these are made available, and, where necessary, estimation based on reliable parameters and proxies;
- institutional indicators, such as the inclusion of specific principles in constitutional or legal instruments, and the establishment and functioning of implementing agencies or other organisations;
- qualitative indicators, which include written reports by government agencies, international organisations, academics and other credible authorities, media sources, information from professionally-conducted research studies using qualitative methods such as focus groups, interviews with informants during an assessment, and invited contributions to a consultation process undertaken as part of an assessment.

Sources. Chapter 9 provides guidance concerning sources and means of verification for all of the questions and indicators included in these categories and themes. This is intended to help researchers making use of the indicators, recognising that the availability of data and information sources will vary significantly between countries. For each theme, there is a list of generic sources of quantitative and qualitative evidence, relevant background documentation, and pointers to established international indices and other indicator frameworks that may be of value.

It is clear that evidence for all of the indicators included in the indicator framework will not be available in all cases. It may be difficult to assess some of the questions and indicators adequately in some countries for this reason. The indicator framework has been explicitly designed to address this by including a diverse range of indicators and potential sources. This should provide enough evidence for a substantive assessment to be made of the Internet environment as a whole notwithstanding data limitations.

UNESCO hopes that the indicator framework will be used as a whole but recognises that doing so can require significant resources in research time and expertise. A shorter, more concentrated and more selective set of core indicators has therefore also been signalled by means of an asterisk next to these indicators within the full framework as set out in Chapters 4 to 8. These can also be found in Annex 4. Taken as a whole, using either the full indicator framework or the core indicators, this will enable researchers to build a collage of quantitative and qualitative measures that supports a comprehensive understanding of the Internet environment from the perspective of UNESCO's ROAM principles.

UNESCO anticipates that the indicator framework will be used by a variety of different assessment teams with different levels of available resources and expertise. Experience with the MDIs suggests that small teams of researchers that bring together diverse experience and perspectives can be particularly effective in drawing out the full range of evidence available, particularly with the benefit of support from a representative steering committee. Such teams can work collaboratively in a relatively short space of time, using a variety of sources and approaches, including desk research into published and online reports and datasets, requests for information to government departments, private companies and other organisations, discussions with key informants, and group discussion within the assessment team itself, drawing on its members' diverse experience and perspectives.

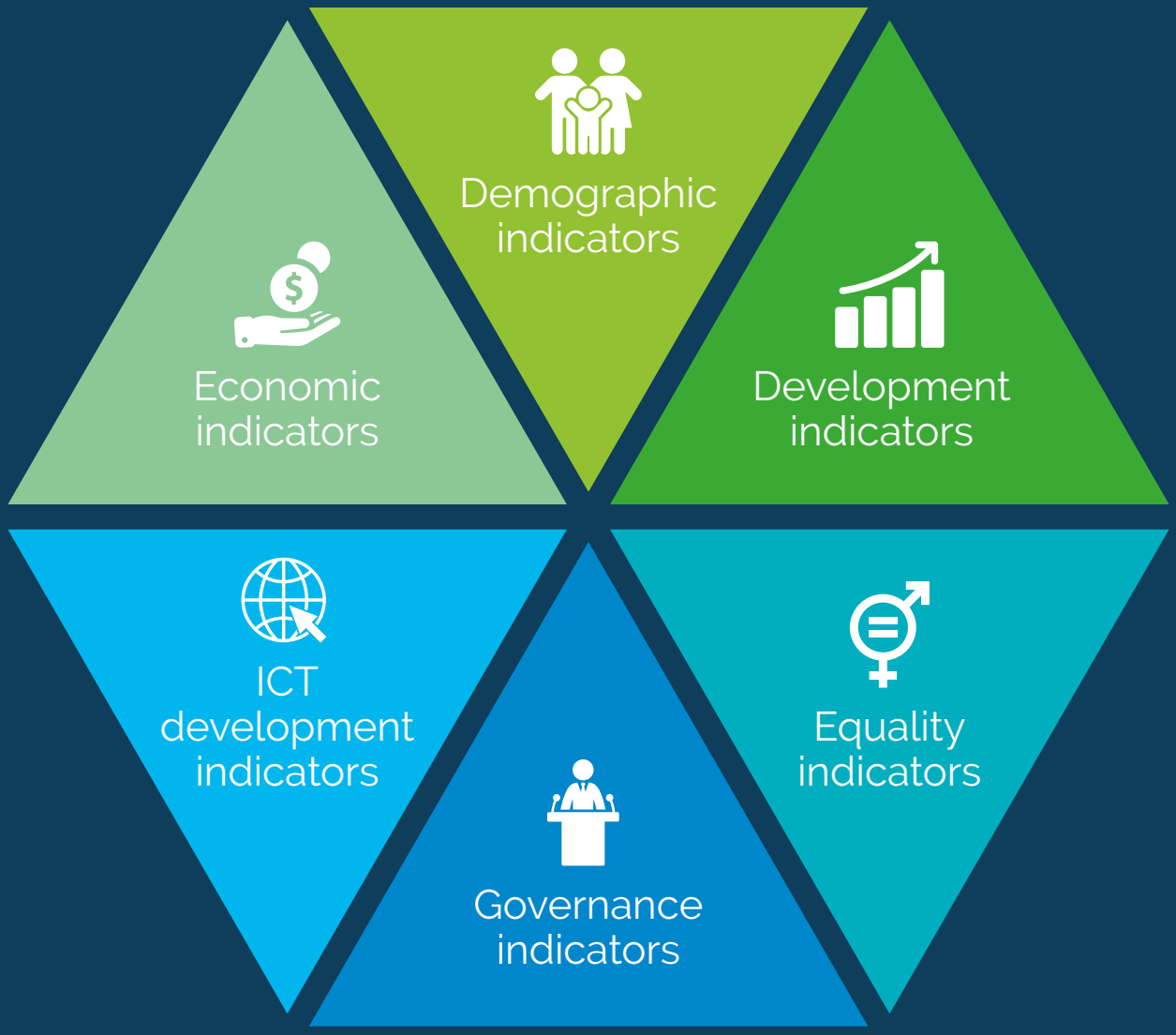
Technical guidance and advice on how researchers can best use the indicators are provided in a companion Implementation Guide (Chapter 10). Issues addressed in this Guide include:

- the identification of available sources and source material;
- the gathering of data from public and private, national and international sources;
- the assessment of quantitative evidence, including data quality, including accuracy, reliability and timeliness;
- the disaggregation of data between different groups within the population;
- the assessment of qualitative evidence, including relevant research and analytical techniques;
- the preparation of reports on findings

3

Contextual **Indicators**

Students (from left) Sawera, Fouzia, Zaruda, Sadia and Gulnaz work on educational programs in the computer room at Bagga Sheikhan school near Rawalpindi, supported by Developments in Literacy (DIL) , Punjab Province, Pakistan on September 28, 2012. Media and Information Literacy (MIL) empowers people to be curious, to search, to critically evaluate, to use and to contribute information and media content wisely.



CONTEXTUAL INDICATORS

In addition to the five ROAMX categories, the proposed indicator framework also includes a number of contextual indicators. These provide background information which is important for interpreting findings derived from indicators in the ROAMX categories. All are derived from data sets or indices compiled by international organisations of various kinds, which are readily available from those organisations' websites and publications. They are divided into six groups, as follows:

1. Economic indicators
2. Demographic indicators
3. Development indicators
4. Equality indicators
5. Governance indicators
6. ICT development indicators

These contextual indicators and their sources are summarised below. In addition to quantitative values for these indicators, those using the indicator framework will find it valuable to consider a country's performance relative to comparable countries, and to assess trends in its performance within their wider context.

Most of these data sets include most but not all countries. It should be noted that, in some cases, data on some countries have been estimated on the basis of historic data or data concerning comparable countries. This is more likely to be the case with Least Developed Countries (LDCs). This may not always be clear in online sources, but information should be available from the international organisations responsible for publication.

1. Economic Indicators

These indicators are concerned with a country's overall economic standing and performance. Indicator A (GNI *p.c.*) is a common proxy indicator for average income, and should be considered alongside contextual indicator 4.A, which is concerned with the distribution of that income. Indicator B (GNI growth rate) measures the extent to which an economy is growing and therefore has the propensity to invest in new technologies. The proportion of the economy which is attributable to services (indicator C) is significant because service sectors have so far been more susceptible to innovation and investment in ICTs than extractive industries, commodities or manufacturing.

Assessments should also take into account special factors affecting national economic performance, such as landlocked, small island (including SIDS) or LDC status.[14]

A. Gross National Income (GNI) (purchasing power parity) *per capit*
The principal source for this indicator is the data set on GNI p.c. maintained by the World Bank.[15]

B. GNI growth rate over the past ten years
The principal source for this indicator is the data set on GNI p.c. maintained by the World Bank.[16]

C. Proportion of GDP attributable to services
The principal source for this indicator is the data set on sectoral distribution of GDP which is maintained by the World Bank.[17]

2. Demographic Indicators

These indicators are concerned with the population of a country. Indicator A (population size) affects the extent to which a country can generate economies of scope and scale in Internet services rather than relying on those that originate elsewhere. Indicator B (life expectancy) is an important indicator of a country's level of development.[1] Indicators C (age profile) and D (linguistic diversity) are important when interpreting the distribution of Internet access and use. Indicator E (urbanisation) affects the cost and pace of infrastructure investment and thereby of the provision of Internet services across a country or territory, as well as being relevant to urban/rural disaggregation.

Other demographic factors which may be particularly relevant in some countries, and which should be considered during investigations, include ethnic and cultural diversity, and the extent of migration (including refugee populations).

A. Overall population size and growth trend
The principal source for this indicator is the data set on population size and growth trend maintained by the Population Division of the UN Department of Economic and Social Affairs.[18]

B. Average life expectancy at birth, disaggregated by sex
The principal source for this indicator is the data set concerning life expectancy at birth maintained by the World Health Organisation (WHO).[19] Data on life expectancy at birth are also included in the Human Development Index (HDI).[20]

C. Proportions of children, young people, people of working age and elderly people
The principal source for this indicator is the data set on population by age group maintained by the Population Division of the UN Department of Economic and Social Affairs.[21]

D. Linguistic diversity
The principal source for this indicator is the index of linguistic diversity (with country summaries) maintained by Ethnologue.[22]

E. Degree of urbanisation
The principal source for this indicator is the data set on urban and rural population size maintained by the Population Division of the UN Department of Economic and Social Affairs.[23]

3. Development Indicators

These indicators are concerned with a country's overall level of development, which, evidence shows, is closely associated with ICT access and use.[24] Indicator A (UNDP's Human Development Index) is a composite index made up of indicators concerned with life expectancy, education and GNI *p.c.*, and is widely used as an overall proxy for development. Indicators B (educational experience) and C (literacy) are concerned with individual capabilities which have a significant bearing on people's capacity to use the Internet. Indicator D (access to electricity) is concerned with crucial complementary infrastructure that facilitates Internet use.

Other factors which may be relevant in some countries, and which should be considered during investigations, include the incidence of humanitarian problems, including conflict and natural disasters.

A. UNDP Human Development Index (HDI)
The principal source proposed for this indicator is the HDI prepared by UNDP and reported in its annual Human Development Report.[25]

1 It is also one component of the Human Development Index, contextual indicator 3A.

B. Mean years of schooling and proportions of appropriate age groups in primary, secondary and tertiary education, disaggregated by sex
The principal source for this indicator consists of data sets which are gathered by the UNESCO Institute for Statistics.[26] Data on mean years of schooling are also included in the HDI.[27]

C. Adult literacy rate, disaggregated by sex (and language where appropriate)
The principal source for this indicator consists of data gathered by the World Bank.[28]

D. Proportion of population covered by electricity supply
The principal sources for this indicator is the World Bank's Sustainable Energy for All database.[29]

4. Equality Indicators

These indicators are concerned with the degree of equality and inequality within society. Evidence shows that levels of equality and inequality are important factors in determining the affordability and extent of Internet access and use. Indicator A (Gini coefficient), which measures the dispersion of wealth or income within a population, is the most widely used indicator of overall societal inequality. Indicator B (gender inequality) is a composite index made up of health, empowerment and labour market indicators.

A. GINI coefficient
The principal source for this indicator is the Gini index produced by the World Bank.[30]

B. Gender Inequality Index
The principal source for this indicator is the Gender Inequality Index generated by the UN Development Programme.[31]

5. Governance Indicators

These indicators are concerned with different aspects of the quality of governance. Indicator A (the World Governance Indicators), is concerned with the overall quality of governance, and includes a variety of sub-indicators concerned with different aspects of governance. Indicator C (the Doing Business Index) is compiled by the World Bank from ten indicators concerned with different aspects of establishing and managing a business in each country. This is particularly important to the development of Internet and online businesses which seek to take advantage of technological innovation and are susceptible to rapid change in technology and markets.

A. World Governance Indicators
The principal source for this indicator are the six aggregate World Governance Indicators developed by the World Bank.[32]

B. Rule of Law Index
The principal source for this indicator is the Rule of Law Index developed by the World Justice Project.[33]

C. Doing Business Index
The principal source for this indicator is the Doing Business Index prepared by the World Bank.[34]

6. ICT Development Indicators

These indicators are concerned with the overall level of ICT preparedness and performance, and provide overall assessments of the ICT environment within which the Internet Universality indicators are located. Indicator A (the ICT Development Index) brings together statistical indicators concerned with ICT access, use and skills. Indicator B (the Mobile Connectivity Index) similarly combines data concerned with infrastructure, affordability, consumer readiness and content for mobile connectivity. Indicator C (the Networked Readiness Index) takes a wider view of the national ICT environment, the readiness of diverse stakeholders to make use of ICTs, and the actual usage evident amongst those stakeholders. Indicator D is concerned with one aspect of ICT development, e-commerce.

A. ICT Development Index
The principal source for this indicator is the ICT Development Index prepared by the International Telecommunication Union (ITU).[35] (Some of the indicators included in this Index are included in Category A of this indicator framework).

B. Mobile Connectivity Index
The principal source for this indicator is the Mobile Connectivity Index prepared by the GSMA Association.[36] (Some of the indicators included in this Index are included in Category A of this indicator framework).

C. World Economic Forum Networked Readiness Index
The principal source proposed for this indicator is the Networked Readiness Index prepared by the World Economic Forum.[37] (Some of the indicators included in this Index are included in Category A).

D. UNCTAD E-Commerce Index
The principal source proposed for this indicator is the B2C (business to consumer) E-Commerce Index prepared by UNCTAD.[38]

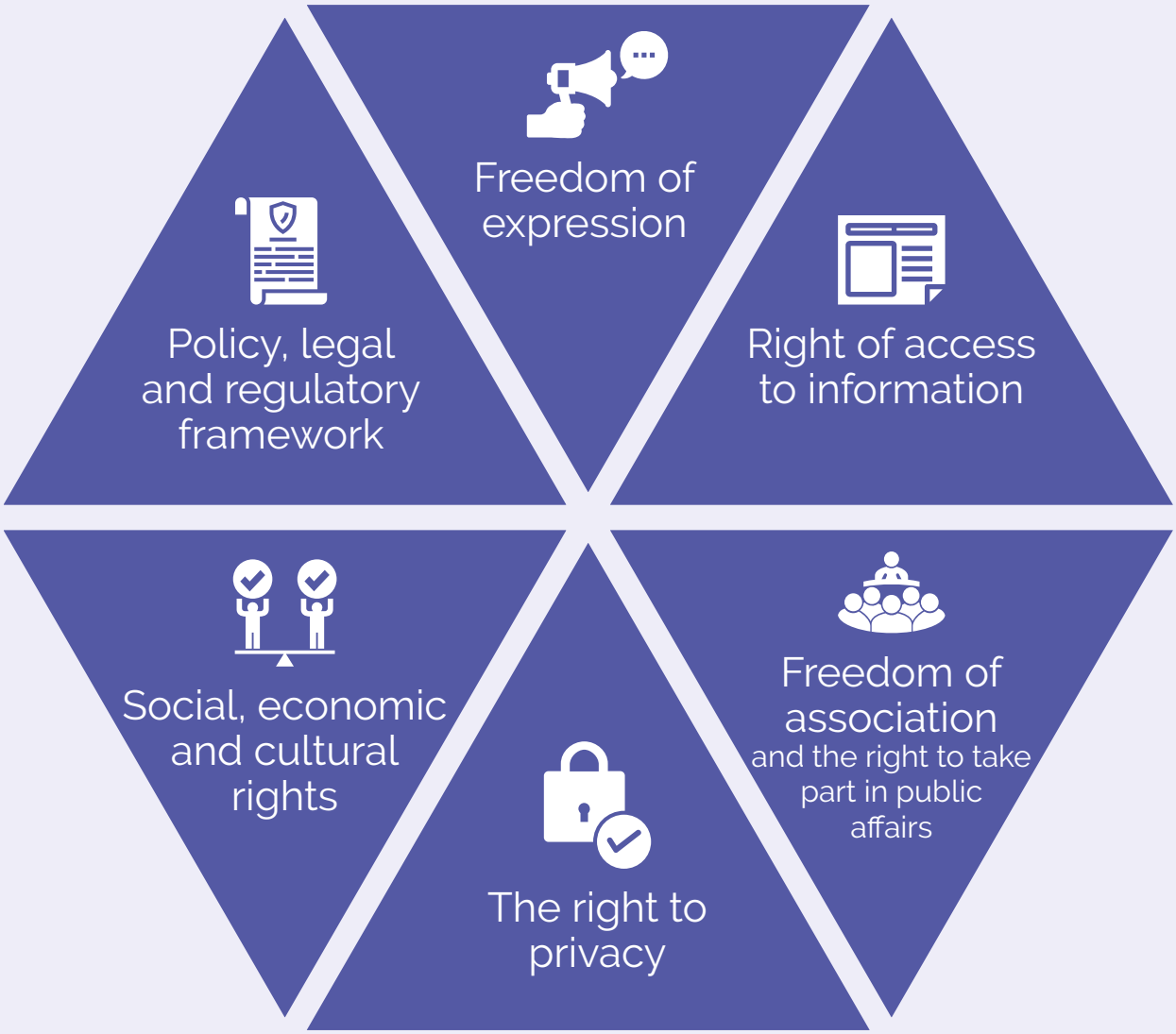
4

Category R
Rights

A Khayae FM reporter interviews a local Htan Tabin shop keeper. Khayae FM, in the Htan Tabin community, is Myanmar's first community radio station. They are currently on-air for 2 hours per day, under a pilot program hoping to bring community radio to people of Myanmar.

R

Rights


Freedom of expression
Right of access to information
Freedom of association and the right to take part in public affairs
The right to privacy
Social, economic and cultural rights
Policy, legal and regulatory framework

Human rights are central to both the Internet and sustainable development. The United Nations' *2030 Agenda for Sustainable Development* envisages 'a world of universal respect for human rights and human dignity, the rule of law, justice, equality and non-discrimination; of respect for race, ethnicity and cultural diversity; and of equal opportunity permitting the full realization of human potential and contributing to shared prosperity.'[39] An Internet environment that failed to uphold this principle would be incompatible with the *Agenda*.

The fundamental principles of human rights have been agreed by the international community in the Universal Declaration of Human Rights (UDHR)[40] and international rights agreements including the International Covenants on Civil and Political Rights (ICCPR)[41] and on Economic Social and Cultural Rights (ICESCR),[42] the Conventions on the Elimination of All Forms of Racial Discrimination (ICERD)[43] and of Discrimination against Women (CEDAW),[44] and the Convention on the Rights of the Child (CRC).[45] The UN Human Rights Council (HRC)[46] and the General Assembly[47] have affirmed that 'the same rights that people have offline must also be protected online.' Aspects of the application of international rights agreements online have been addressed in resolutions of the HRC.

These international agreements emphasise that no restrictions may be placed on rights other than 'those which are prescribed by law and which are necessary in a democratic society in the interests of national security, […] public order, the protection of public health or morals or the protection of the rights and freedoms of others.'[1] In particular, the Human Rights Council has asserted the importance of legal frameworks, proportionality and independent oversight of any such restrictions if they are to be legitimate and to avoid counting as violations of the affected rights.

Internet Universality emphasises the importance of harmony between the growth and use of the Internet and human rights. A free Internet is one that respects the human rights set out in these international agreements and enables people to enjoy and exercise them fully. It includes the full range of inter-relationships between human rights and the Internet, such as freedoms of expression and association, privacy, cultural participation, gender equality, security and rights concerned with education, employment and welfare.

This category of the indicator framework is divided into six themes, each of which includes a number of questions and associated indicators.

- Theme A is concerned with the overall policy, legal and regulatory framework for human rights and their relation to the Internet.
- Theme B is concerned with freedom of expression.
- Theme C is concerned with the right to access information.
- Theme D is concerned with freedom of association and with rights to participate in public life.
- Theme E is concerned with the right to privacy and related issues.
- Theme F is concerned with economic, social and cultural rights.

Understanding and assessment of the rights which are included in this category should include all of the rights agreements identified above. Assessments should pay particular attention to the rights of women and of children, as articulated in CEDAW and the CRC, relating findings concerning these to those sections of category X which are concerned with gender and with children. Particular attention may be to other groups within society, including indigenous peoples and ethnic minorities, persons with disabilities, and migrant and refugee communities.

National assessments should also pay attention to regional rights agreements such as the American Convention on Human Rights,[48] the African Charter on Human and Peoples Rights,[49] and the European Convention for the Protection of Human Rights and Fundamental Freedoms.[50] They should also consider the consistency of the relationship between the implementation of rights offline and online, which should be considered holistically rather than distinctly one from another.

1 ICCPR, Art. 22.2. This should not be taken to imply that States are permitted to place restrictions on all rights. There should therefore be no interpretation to mean, for example, that the rights to be free of torture and slavery could ever be justifiably restricted.

Theme A • Policy, Legal and Regulatory Framework

The fundamental principles of human rights have been agreed by the international community in the *Universal Declaration of Human Rights* (UDHR)[51] and international rights agreements including the International Covenants on Civil and Political Rights (ICCPR)[52] and on Economic Social and Cultural Rights (ICESCR),[53] the Conventions on the Elimination of All Forms of Racial Discrimination (ICERD)[54] and of Discrimination against Women (CEDAW),[55] and the Convention on the Rights of the Child (CRC).[56] A number of regional rights agreements have also been agreed.

The UN Human Rights Council[57] and the General Assembly[58] have affirmed that 'the same rights that people have offline must also be protected online.' The Human Rights Council has also adopted several resolutions on 'the promotion, protection and enjoyment of human rights on the Internet,' which address aspects of these and subsequent questions and indicators.[59]

A.1 Is there a legal framework for the enjoyment and enforcement of human rights which is consistent with international and regional rights agreements, laws and standards, and with the rule of law?

Indicator:

- ▶ Existence of a constitutional or legal framework, including oversight arrangements, which is consistent with international and regional rights agreements, laws and standards, and evidence that it is respected and enforced by government and other competent authorities[2]

A.2 Is there a legal framework which recognises that the same rights that people have offline must also be protected online?

Indicator:

- ▶ Evidence that the principle of online/offline equivalence is accepted and implemented in law and practice

A.3 Is there a legal framework to protect individuals against violations of rights which arise from use or abuse of the Internet?

Indicator:

- • Existence of a legal framework and appropriate procedural powers concerned with protection against cybercrime, Internet-enabled crime and rights violations which is consistent with international and regional rights agreements, laws and standards[3]

2 Indicators marked with a triangle have been identified as 'core indicators'. The subset of core indicators can be used to undertake less comprehensive assessments of Internet Universality where resources are insufficient for a full assessment. These core indicators can also be found in Annex 4.

3 Definitions of cybercrime vary. Assessments should refer both to national legal frameworks and to international agreements such as those reached by the UN Office on Drugs and Crime (see Chapter 9).

A.4 Do individuals have recourse to effective remedies to address violations of rights, online and offline, by state or non-state actors?4

Indicators:

- Legal framework for due process and effective remedies
- Existence and effective functioning of a national human rights institution
- Evidence from legal judgements and court rulings

A.5 Are judges, magistrates and other legal professionals trained in issues relating to the Internet and human rights?

Indicator:

- Availability of relevant courses and proportions of relevant personnel who have undertaken or completed training

Theme B • Freedom of Expression

Freedom of expression is one of the human rights within the *Universal Declaration* that has been significantly affected by the Internet's emergence as a communications medium. It is defined in article 19(2) of the ICCPR as including an individual's 'freedom to seek, receive and impart information and ideas of all kinds, regardless of frontiers, either orally, in writing or in print, in the form of art, or through any other media of his choice.'[60] Regional rights agreements also include relevant provisions.

Article 19(3) of the ICCPR states that the exercise of these rights 'may be subject to certain restrictions, but these shall only be such as are provided by law and are necessary: (a) for respect of the rights or reputations of others; [or] (b) for the protection of national security or of public order, or of public health or morals.'[61] Other international agreements place restrictions on information concerning (for example) racial hatred (ICERD) and child sex abuse images (CRC). The UN Human Rights Committee emphasised in its General Comment No. 34 (2011) that any such restrictions must be provided by law, necessary for the explicit purposes set out in the Article, and proportionate.[62] It is also relevant to consider differences that may exist between legal frameworks and implementation online and offline.

Questions B.1 to B.4 are concerned with the overall legal and regulatory framework for freedom of expression within a country.[63] Questions B.5 and B.6 are concerned with the extent to which individuals can and do exercise expression. Questions B.7 and B.8 are concerned with the punishment of expression and with self-censorship. The questions and indicators in Category A Theme D are also relevant to this theme.

4 Note that the term "violations" as used here covers both violations of human rights by state actors as well as abuses of human rights by non-State actors.

B.1 Is freedom of expression guaranteed in law, respected in practice, and widely exercised?

Indicators:

- Constitutional or legal guarantee of freedom of expression consistent with ICCPR Article 19, and evidence that it is respected and enforced by government and other competent authorities[64]
- Constitutional or legal guarantee of press/media freedom consistent with ICCPR Article 19
- Assessments by credible and authoritative sources of extent and diversity of expression online and offline

B.2 Are any restrictions on freedom of expression narrowly defined, transparent and implemented in accordance with international rights agreements, laws and standards?

Indicator:

- Legal restrictions on freedom of expression that are consistent with international and regional rights agreements, laws and standards, and evidence that these are respected by government and other competent authorities

B.3 To what extent is ex ante or ex post censorship5 of online content undertaken, on what grounds and with what transparency?

Indicators:

- Legal or regulatory framework relating to restrictions on freedom of expression
- Quantitative and qualitative evidence of ex ante and ex post censorship of online content

B.4 Under what conditions does the law hold platforms and other online service providers liable for content published or shared by users on them?

Indicator:

- Legal framework for intermediary liability and content regulation is consistent with international and regional rights agreements, laws and standards, and evidence concerning proportionality of implementation

B.5 What proportion of the population generates online content?

Indicator:

- Proportion of the population making use of social media, microblogging and blogging services

B.6 Are individuals, journalists or other media/online actors subject to arbitrary detention, prosecution or intimidation for disseminating information online?

Indicators:

- Existence and nature of relevant legal provisions and practice

5 i.e. censorship which is exercised before publication (ex ante) and after publication (ex post)

- Evidence concerning the extent and nature of arbitrary detentions and prosecutions for online expression

B.7 Do individuals, journalists or other media/online actors practice self-censorship in order to avoid harassment by government or other online actors?

Indicators:

- Evidence of self-censorship by journalists, bloggers and other media/online actors
- Evidence of self-censorship as a result of online abuse, particularly by women and children

Theme C • Right of Access to Information

The right of access to information concerns the right to access information and ideas which have been published or made available by others. It is included in Article 19(2) of the ICCPR which asserts the freedom 'to seek [...] information and ideas of all kinds, regardless of frontiers, [...] through any [...] media of [...] choice.'[65] Article 19(3) of the ICCPR (see above) and related provisions in other international and regional rights agreements also address access to information, including restrictions concerning 'propaganda for war' and 'advocacy of national, racial or religious hatred that constitutes incitement to discrimination, hostility or violence' (ICCPR Article 20), and 'exploitative use of children in pornographic performances and materials' (CRC Article 34).

As with freedom of expression, the Human Rights Committee has asserted the importance of legal frameworks, requirement for necessity and proportionality in any restrictions permitted to these rights.[66]

This should be distinguished from measures concerning the ability to access government or publicly-funded information, which is addressed in Category O Themes C and D.

Question C.1 in this theme is concerned with the overall legal framework for access to information. Question C.2 is concerned with the presence or absence of censorship by government, as seen from the perspective of consumers of online information. Question C.3 is concerned with the diversity and independence of content which is available within the country, and question C.4 with the related issue of harassment by government agencies and other stakeholders. The questions and indicators in Category A Theme D are also relevant to this theme.

C.1 Is the right of access to information guaranteed in law and respected in practice?

Indicators:

- Constitutional or legal guarantee of the right of access to information consistent with international and regional rights agreements, laws and standards, and evidence that it is respected and enforced by government and other competent authorities
- Objectives and scope of restrictions on access to content, online and offline

C.2 Does the government block or filter access to the Internet as a whole or to specific online services, applications or websites, and on what grounds and with what degree of transparency is this exercised?

Indicators:

- Legal framework for blocking or filtering Internet access, including transparency and oversight arrangements
- Evidence in government and court decisions, and from other credible and authoritative sources, concerning blocking or filtering of access
- Incidence, nature and basis for shutdowns or other restrictions on Internet connectivity
- Numbers and trend of content access restrictions, takedowns of domain names and other interventions during the past three years

C.3 Is a variety of news sources and diverse viewpoints on issues of public importance available online?[6]

Indicator:

- Number and diversity of news services concerned with international, national and local news, online and offline

C.4 Are individuals, journalists or other online/media actors subject to arbitrary detention, prosecution or intimidation for accessing information online?

Indicators:

- Scope and nature of legal provisions and practice
- Numbers of arbitrary detentions and prosecutions for access to content that is not illegitimate in terms of international agreements as to the circumstances and criteria for permissible restrictions.7

6 This issue is covered more extensively in the Media Development Indicators.

7 See introductory text above.

Theme D • Freedom of Association and the Right to take part in the Conduct of Public Affairs

Freedom of association is another human right which has been particularly affected by the Internet. Article 21 of the ICCPR establishes the right of peaceful assembly, and Article 22 the right to freedom of association with others.

The first question in this theme (D.1) is concerned with the overall legal framework for freedom of association. Question D.2 is concerned with the ability of civil society organisations to organise effectively online.

Article 25 of the ICCPR states that 'Every citizen shall have the right and the opportunity … to take part in the conduct of public affairs, directly or through freely chosen representatives,' and 'to have access, on general terms of equality, to public service in his country.'

Questions D.3 and D.4 are concerned with the extent to which government has enabled citizens to exercise this right online as well as offline.

D.1 Is freedom of association guaranteed in law and respected in practice?

Indicator:

- Existence of an established legal framework that is consistent with international and regional rights agreements, laws and standards, and evidence that it is respected and enforced by government and other competent authorities

D.2 Can non-governmental organisations organise freely online?

Indicator:

- Evidence of online organisation, and absence of undue interference with such organisation

D.3 Are there government policies for e-government and/or e-participation that encourage participation in government and public processes?

Indicators:

- Existence of government policies for e-government and e-participation, including use of the Internet for public consultation

- Assessments in the Online Services Index of UNDESA's E-Government Development Index
- Values/rankings in UNDESA's e-participation index

D.4 Are government websites/apps available that enable individuals to undertake a wide range of e-government activities securely online as well as offline?

Indicators:

- Number of national e-government services available through websites and apps
- Number of users of e-government services (disaggregated by sex and, where appropriate, by language)
- Extent to which data on e-government sites have transparent terms of service, are protected by cybersecurity measures and encryption (e.g. https) and are available using diverse browsers and operating systems
- Credible reports concerning cybersecurity of government websites and services

Theme E • The Right to Privacy

Privacy is another right that has been substantially affected by the Internet. Article 17 of the ICCPR provides that 'No one shall be subjected to arbitrary or unlawful interference with his [*sic*] privacy, family, home or correspondence, nor to unlawful attacks on his honour and reputation,' and stipulates that 'Everyone has the right to the protection of the law against such interference or attacks.' Article 16 of the CRC further asserts these rights for children.

While freedoms of expression and association, and the right of access to information, are generally considered to have been extended by the Internet, there has been growing concern about threats to privacy which may be posed by it, including surveillance by governments and tracking by third parties, the exploitation of private data for commercial ends and the unlawful acquisition and use of data for criminal purposes.

The UN General Assembly has adopted a number of resolutions concerning 'the right to privacy in the digital age,' which, in addition to general principles, have addressed issues including surveillance, encryption and anonymity.[67]

Questions E.1. E.2 and E.3 are concerned with legal arrangements for privacy, data protection and surveillance. Data protection in this context relates to the collection, analysis, use, storage, transfer and sharing of data. Questions E.4, E.5 and E.6 are concerned with individuals' rights concerning their own identities. Questions E.7 and E.8 are concerned with the relationship between the state and business holders of commercial and personal data sets.

E.1 Is the right to privacy guaranteed in law and respected in practice?

Indicators:

- Constitutional or legal definition of privacy and right to privacy and evidence that it is respected by government and other competent authorities
- Number of privacy violations reported to and by data protection authority or equivalent entity, as a proportion of population

- Evidence from media and civil society sources concerning privacy violations

E.2 Is the protection of personal data guaranteed in law and enforced in practice, with respect to governments, businesses and other organisations, including rights of access to information held and to redress?

Indicators:

- Legal framework for data protection, including monitoring mechanisms and means of redress, and evidence that it is respected and enforced by government and other competent authorities
- Legal framework concerning the commercial use of personal data and international data transfer/security, including monitoring mechanisms and means of redress
- Existence and powers of an independent data protection authority or similar entity

E.3 Are the powers of law enforcement and other agencies for the lawful interception of user data necessary, proportionate and limited to circumstances which are consistent with international and regional rights agreements, laws and standards? [68]

Indicator:

- Legal framework for the lawful interception of data, including independent oversight and transparency, and evidence concerning implementation by government and other competent authorities

E.4 Are any requirements for identification and registration, including telephone and Internet subscription registration, necessary, proportionate and consistent with international and regional rights agreements, laws and standards?

Indicator:

- Nature and proportionality of identity and registration requirements, if any, including verification processes

E.5 Are data encryption and online privacy protected in law and practice in a way that is consistent with international and regional rights agreements, laws and standards?[69]

Indicator:

- Existence of a legal framework consistent with international rights agreements and evidence that it is respected by government and other competent authorities

E.6 Do individuals have legal rights to protect their online identity and to manage or correct information concerning them online, in ways that protect their rights to privacy as set out in Article 17 of the ICCPR?

Indicator:

Legal frameworks and jurisprudence concerning privacy and freedom of expression, and evidence that they are respected by government and other competent authorities

E.7 Are government requirements for Internet businesses to provide information to government agencies concerning Internet users necessary, proportionate, transparent and consistent with international and regional rights agreements, laws and standards?

Indicator:

- Legal and regulatory provisions concerning the provision of information about users to government

E.8 Are provisions concerning the location and duration of data retention consistent with international standards of data protection and legitimate requirements of law enforcement?

Indicator:

- Legal and regulatory provisions concerning data retention and cross-border data flows, and evidence of enforcement by government and other competent authorities

Theme F • Social, Economic and Cultural Rights

The Internet is widely believed to hold great potential for economic and social development, including many of the goals which are set out in the UN's *2030 Agenda for Sustainable Development*.[70] The developmental impact of the Internet is covered in Category X Theme C, which is specifically concerned with Sustainable Development.

Economic, social and cultural rights are also identified and elaborated in the ICESCR.[71] This theme is concerned, in general terms, with the integration of those rights which are included in the ICESCR with Internet Universality, and should be considered in conjunction with Category X Theme C (Sustainable Development).

Articles 6 to 14 of the ICESCR are concerned with the progressive realisation of rights concerned with employment, social security, family life, an adequate standard of living including freedom from hunger, health and education. Question F.1 is concerned with the incorporation of the Internet in national strategies for three of these areas of economic and social policy: employment, health and education.

Article 15 of the ICESCR recognises the right of everyone to take part in cultural life. Question F.2 is concerned with the extent to which this right can be enjoyed online by people from different communities and ethnicities within the country.

F.1 Do government policies incorporate the Internet in strategies concerned with employment, health and education,[8] with particular reference to ICESCR rights?

Indicators:

- Evidence of inclusion of a) the Internet, and b) respect for ICESCR rights, in sector strategies for employment, health and education
- Evidence of analysis by government of the impact of Internet on employment, health and education
- Submission and content of country reports to the OHCHR on implementation of ICESCR rights

F.2 Are all citizens and other individuals equally able to take advantage of the Internet to participate in cultural activities?

Indicators:

- Extent and nature of differences in Internet access and use between different communities/ethnicities
- Existence of government policy concerning cultural heritage online
- Constitutional or legal guarantee of freedom of artistic expression

8 These have been selected as representative groups of ESC rights.

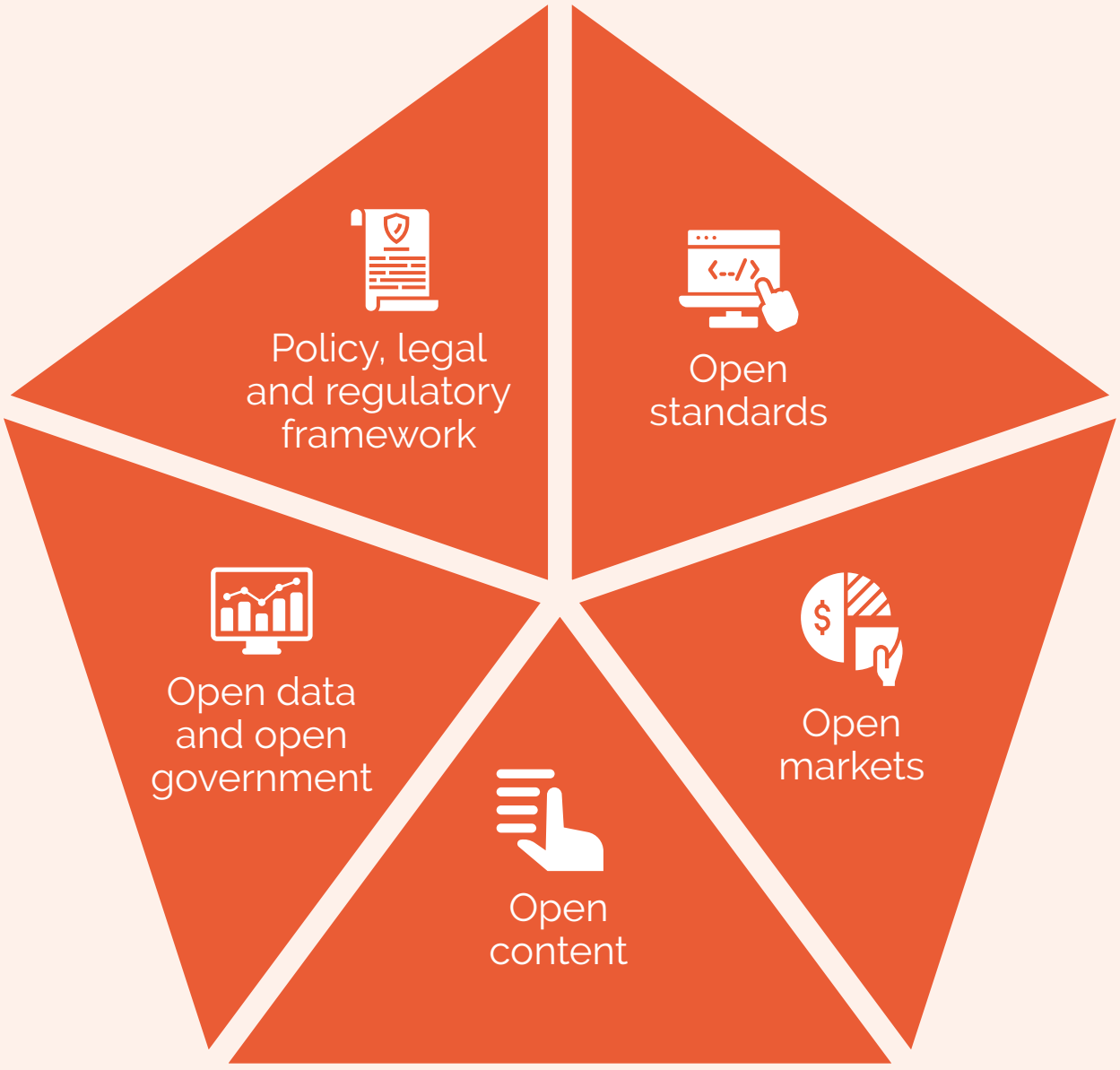
5

Category O
Openness

In Oaxaca, Mexico, the Indigenous Community Telecommunications network (TIC) provides affordable mobile phone and Internet services to rural areas. Supported by the non-profit organization Rhizomatica, the project helps communities who need or want to build and maintain self-governed and owned telecommunications infrastructures.

O

Openness


Policy, legal and regulatory framework
Open standards
Open data and open government
Open markets
Open content

Internet Universality's second principle is that the Internet should be open for all to develop or take advantage of its resources and opportunities in whatever ways seem most appropriate or valuable to them. The category of openness is concerned alike, therefore, with technical issues, markets, content, transparency and trust in the Internet and Internet-enabled services, including issues such as open source software and development, open government, open data and open educational resources. Through openness, Internet Universality acknowledges the integrity of the Internet as enabling a common global exchange, rather than being confined to 'walled gardens' based on incompatible technologies.

- This category is divided into five themes:
- Theme A is concerned with the overall policy, legal and regulatory framework.
- Theme B is concerned with open standards.
- Theme C is concerned with open markets.
- Theme D is concerned with open content.
- Theme E is concerned with open data.

Open standards, interoperability, public application programming interfaces (APIs) and open source software have made a vital contribution to the technical development of the Internet, enabling it to evolve more expeditiously and facilitating service innovation. Open markets have also played an important part in the development of the Internet, allowing market access to innovative and competitive businesses rather than excluding these through restrictive licensing arrangements or protectionist limitations on service provision. For example, the Linux operating system has fostered an extensive IT ecosystem, while W3C[1] standards have enabled a usable/accessible web experience for users.

Openness to new technologies and market access are important but not sufficient conditions for the innovation that has enabled the Internet to move from the margins of society and economy to the mainstream of development.

Trust and security in the integrity of the Internet and Internet-enabled services are essential for the Internet to function effectively and in the interests of all. These are linked, in turn, to the degree to which transparency is part of the openness of the Internet. Attention should also be paid to Theme D in Category X when assessing this category

1 World Wide Web Consortium.

Theme A • Policy, Legal And Regulatory Framework

An appropriate policy, legal and regulatory framework – including multistakeholder governance structures – is necessary to support an evidence-based, transparent and forward-looking policymaking process that will preserve the Internet as an open, public and universal resource. Policy instruments should seek to ensure that the Internet runs on an open and neutral platform, facilitating cooperation and competition through interoperability, and delivering content and applications to users in a secure environment which respects human rights.

Questions A.1 and A.2 are concerned with the policy, legal and regulatory frameworks, respectively, for the Internet and Internet-enabled services. Question A.3 is concerned with the extent to which the ability to innovate online is universally available within the country.

A.1 Is there an overall policy, legal and regulatory framework for Internet development and policymaking which is consistent with international norms concerning openness and transparency?[1]

Indicators:

- Existence of an overall framework consistent with relevant international norms[72]
- Existence of legal and regulatory frameworks to enable e-commerce, digital signatures, cybersecurity, data protection and consumer protection

This question and indicators are also included in Category M Theme A.

A.2 Does the legal and regulatory framework for business, academia and civil society facilitate innovation on the Internet?

Indicators:

- ▶ Evidence concerning the conduciveness of the legal and regulatory framework towards the establishment of new business ventures and innovation by academia and civil society[2]
- ▶ Perceptions of experience of the regulatory environment for business and ICTs by businesses, including Internet-enabled business

1 These norms arise from agreements in international organisations concerned with the Internet, and evolve along with Internet technology and services.

2 Indicators marked with a triangle have been identified as 'core indicators'. The subset of core indicators can be used to undertake less comprehensive assessments of Internet Universality where resources are insufficient for a full assessment. These core indicators can also be found in Annex 4.

A.3 Are there restrictions on which organisations or individuals can establish Internet, or Internet-enabled, services?

Indicator:

- Requirements of legal framework for the establishment of Internet and Internet-enabled services and businesses

Theme B • Open Standards

The evolution of the Internet requires attention by all stakeholders to the implementation of standards and protocols that facilitate the growth and security of the Internet. Open standards play a crucial role in promoting interoperability, and thereby innovation and the diversity of service provision on the Internet. Public authorities can play an important part in promoting open standards through the procurement and provision of public services.

Questions B.1 and B.2 are concerned with the overall legal and regulatory framework for open standards. Question B.3 is concerned with free and open source software (FOSS). Question B.4 is concerned with the extent to which two major developments in global Internet protocols/standards which are considered vital to the future development of a secure global Internet – IPv6 and DNSSEC - have been deployed within the country. National participation in international standard-setting processes is included in Category M Theme C.

B.1 How does the legal and regulatory framework encourage and/or constrain investment and innovation using all available technologies?

Indicators:

- Evidence concerning public policy and practice towards online innovation, including procurement of public services
- Evidence concerning the initiation and sustainability of Internet start-ups

B.2 Do national standards setting processes conform to international standards including due process and transparency?

Indicators:

- Legal and regulatory arrangements for standards processes
- Perceptions of standards processes amongst relevant stakeholders
- Indicators in Category M are also relevant to participation in standard setting processes.

B.3 Does the government promote the diversity of intellectual property licensing options including free and open-source software (FOSS)?

Indicators:

- Government policy towards FOSS and other licensing options
- Extent to which software with diverse licensing options are used in government departments

B.4 Does the government promote and adopt standards to facilitate accessibility to the Internet and e-government services for persons with disabilities?

Indicators:

- Government policy and practice towards ensuring accessibility for persons with disabilities
- Perceptions of persons with disabilities concerning accessibility policy and practice

B.5 How extensively are developments in Internet protocols and standards implemented within the country?

Indicators:

- Data concerning the extent of IPv4 and IPv6[3] deployment
- Data concerning the extent of DNSSEC[4] deployment
- Evidence concerning adoption of current international cybersecurity standards and best practices

Theme C • Open Markets

Open markets for networks and communications services facilitate consumer choice, stimulate innovation and tend to lead to lower prices and improved quality of service for end-users. An open market approach seeks to promote an efficient, affordable, innovative environment for the development of the Internet, recognising the risk that market concentration could lead to reduced choice and opportunity for users. Independent regulators have been established in many countries to oversee competition amongst network and telecommunication services.

Questions C.1., C.2 and C.3 are concerned with the legal and regulatory framework governing markets for communications networks and Internet domains. Questions C.4 and C.5 are concerned with the extent to which there is competition between suppliers of networks and services, including the availability of international online services. These questions are also relevant to Category R Themes B (Freedom of Expression) and C (Right to Access Information).

3 Internet Protocol versions 4 and 6.

4 Domain Name System Security Extensions.

Cooperation between competing services is also necessary to maximise the value of communications networks, for example through technical interoperability. Question 7 is concerned with the existence and performance of Internet Exchange Points (IXPs) for the local exchange of Internet traffic.

C.1 Is there independent regulation of communications markets, undertaken in accordance with international norms and standards?

Indicators:

- Existence of an independent regulatory authority or authorities
- Evidence concerning regulatory performance, including perceptions of the quality of regulation by communications businesses, consumer associations and other organisations

C.2 Are licensing and allocation of critical resources (including spectrum) transparent, flexible, technology- and service-neutral, non-restrictive and non-discriminatory?

Indicators:

- Legal and regulatory arrangements for spectrum, including affordability of access to spectrum
- Perceptions of the quality of arrangements for licensing and allocation of critical resources among relevant stakeholders

C.3 Is there independent management of the domain name system?

Indicators:

- Independence of the domain name registrar and legal arrangements concerning domain name registration
- Proportion of domain registrations from the country which are registered as ccTLDs

C.4 Is there sufficiently effective competition in communications access networks to protect consumer interests?

Indicators:

- Number of fixed and mobile broadband providers
- Market shares of fixed and mobile broadband providers
- Rating in the Internet and telephony sectors competition sub-index of the Networked Readiness Index

C.5 Can Internet users choose between diverse Internet service providers, including domain name registrars, ISPs and online services?

Indicators:

- Number of domain name registrars[5] and distribution of market shares
- Number of ISPs and distribution of market shares

5 A domain name registrar is an organisation which registers domains on behalf of end-users. In most countries this is a competitive market. It should not be confused with the unique national domain name registry which manages the domain itself and accredits registrars.

- Restrictions, if any, on access to online service providers based outside the country (including, for example, search, social media, microblogging, news access and e-commerce platforms)
- Availability, extent of use and distribution of market share within the country between online service providers in core areas of Internet use (including, for example, search, social media, microblogging, news access and e-commerce platforms)

C.6 Are communities able to establish their own networks to provide Internet access?

Indicator:

- Legal framework enabling establishment of community networks.[6]

C.7 Are there Internet Exchange Points (IXPs), peering and other arrangements for exchange of Internet traffic that facilitate effective access?

Indicators:

- Existence and effective management of IXP(s)
- Proportion of domestic traffic using IXPs, including trend
- Latency levels for leading mobile broadband services to access national, regional and international servers
- Existence of local caching services for international content

Theme D • Open Content

The theme of open content is concerned with providing for the availability of content of all kinds, including public information and information from other sources within and beyond the country, which can be made available online. Legal requirements and licensing restrictions may change the degree of openness of content, place requirements on the use of content or restrict its distribution. Open content approaches seek to maximise the availability of content to end-users, through open licensing arrangements that are consistent with international intellectual property agreements. For example, Creative Commons licenses allow content creators to set licence conditions which they consider appropriate to their content. There has been particular interest in the availability of educational content through open educational resources (OER).

This theme is related to – and should be considered alongside – Theme C (Access to Information) in Category R. Questions D.1 and D.2 are concerned with the government's overall policy on access to knowledge and on the implementation of international intellectual property agreements. Questions D.3 and D.4 are concerned with the openness of public information and with open educational resources, respectively. Questions D.5 and D.6 are concerned with relevant regulatory provisions, concerning net neutrality and virtual private networks.

6 The definition of community networks will vary between countries.

D.1 Does the government actively promote access to knowledge and open content through its policies for education, culture and science?

Indicators:

- Existence and nature of government policy and practice on access to knowledge, including information generated using public funds and other information of public interest
- Stakeholder perceptions of government policy and practice concerning access to knowledge, and of their impact

D.2 Do arrangements for intellectual property protection balance the interests of copyright holders and information users in ways that promote innovation and creativity?

Indicators:

- Nature of legal arrangements for copyright enforcement, including arrangements for access to and fair use of copyright material[7]
- Government policy and practice concerning the availability and use of alternative intellectual property arrangements such as Creative Commons licenses

D.3 Does the government provide or encourage access to and facilitate sharing of public and publicly-funded information?

Indicators:

- Extent to which licensing options promoting free reuse of content are deployed in government departments and the public education system
- Evidence concerning the extent of use of access to such content

Consideration should be given and cross-reference made to data/evidence for indicators concerning government policies on e-government and e-participation (Category R: Questions D.3, D.4) and public access facilities which can be used to access public information (Category A: Question A.5).

D.4 Does the government encourage the use of open educational resources (OER) and facilitate open access to academic and scientific resources?

Indicators:

- Educational policy framework concerning OER
- Arrangements for access to academic and scientific resources by higher education institutions and students

7 Given diverse legal traditions, the notion of "fair use" in this indicator needs to be interpreted in terms of the applicable law and the national regulatory framework as regards the existence or otherwise of any exceptions to copyright (such as for cases of commentary, criticism, teaching and research).

D.5 Does the government require ISPs to manage network traffic in a way that is transparent, impartial and neutral, without discriminating against particular types of content or content from particular sources?

Indicator:

- Regulatory arrangements and practice concerning net neutrality and competition for online and network services

D.6 Does the government allow individuals to publish and access content through protocols and tools of their own choice, including virtual private networks (VPNs)?

Indicator:

- Legal framework and practice concerning the rights of end-users to publish and access content through all available tools, including VPNs

Theme E • Open Data and Open Government

Open data policies are concerned with making publicly available data that are gathered by governments (and, sometimes, other stakeholders) so that they can be used by individuals, businesses (including both local and foreign businesses) and civil society organisations to undertake their own analysis and support their own objectives. The benefits of open data policies include improved access to knowledge, opportunities for business innovation and service provision, improved data analysis through recombination of data from diverse sources, and improved policymaking as a result of more rigorous expert analysis by diverse stakeholders. Data protection arrangements are important in ensuring that open data sets do not undermine individual privacy.

Question E.1 concerns the legal framework for open data, while questions E.2 to E.4 are concerned with its implementation by governments. Questions E.5 and E.6 are concerned with the use of data, including the impact of use on development.

E.1 Has legislation been enacted which requires open access to public and publicly-funded data, with appropriate privacy protections, and is that legislation implemented?

Indicators:

- Existence of a legal framework for access to open data which is consistent with international norms[73] and privacy requirements
- Evidence concerning implementation of the legal framework
- Evidence concerning the extent to which open data resources are available and used online

E.2 Do government departments and local government agencies have websites which are available in all official languages and through all major browsers?

Indicators:

- Government policy to ensure provision of websites with appropriate language and browser access, and evidence concerning effective implementation
- Proportion of government services with websites (value/ranking in UNDESA online services index)
- Quality of government websites (extent of language availability, range of content, availability of mobile version)
- Proportion of adults who have used e-government services within twelve months, aggregate and disaggregated[8]

E.3 Do government and other public stakeholders provide easy online access to anonymised publicly-held data sets,[9] including machine-readable access to original data?

Indicators:

- Legal framework concerning access to publicly-held data sets, including arrangements for anonymisation, and evidence of implementation by government and other competent authorities
- Number and range/diversity of open data sets made available by government and available through public access facilities
- Data on the extent of use of open data to which access is provided by users within and outside the country

E.4 Can individuals and organisations use and share data which have been made publicly available?

Indicator:

- Legal framework concerning access to public information and nature of any restrictions, including restrictions concerning privacy

E.5 Are open data used by stakeholders in ways which have a positive impact on sustainable development?

Indicators:

- Number of access requests for open data from government sources
- Evidence of use of open data to support sustainable development in selected sectors (*e.g.* environment, health, agriculture, enterprise)

8 With particular reference e.g. to gender, age, locality, ethnicity and disability.

9 Public data, as understood here, should not include personal data.

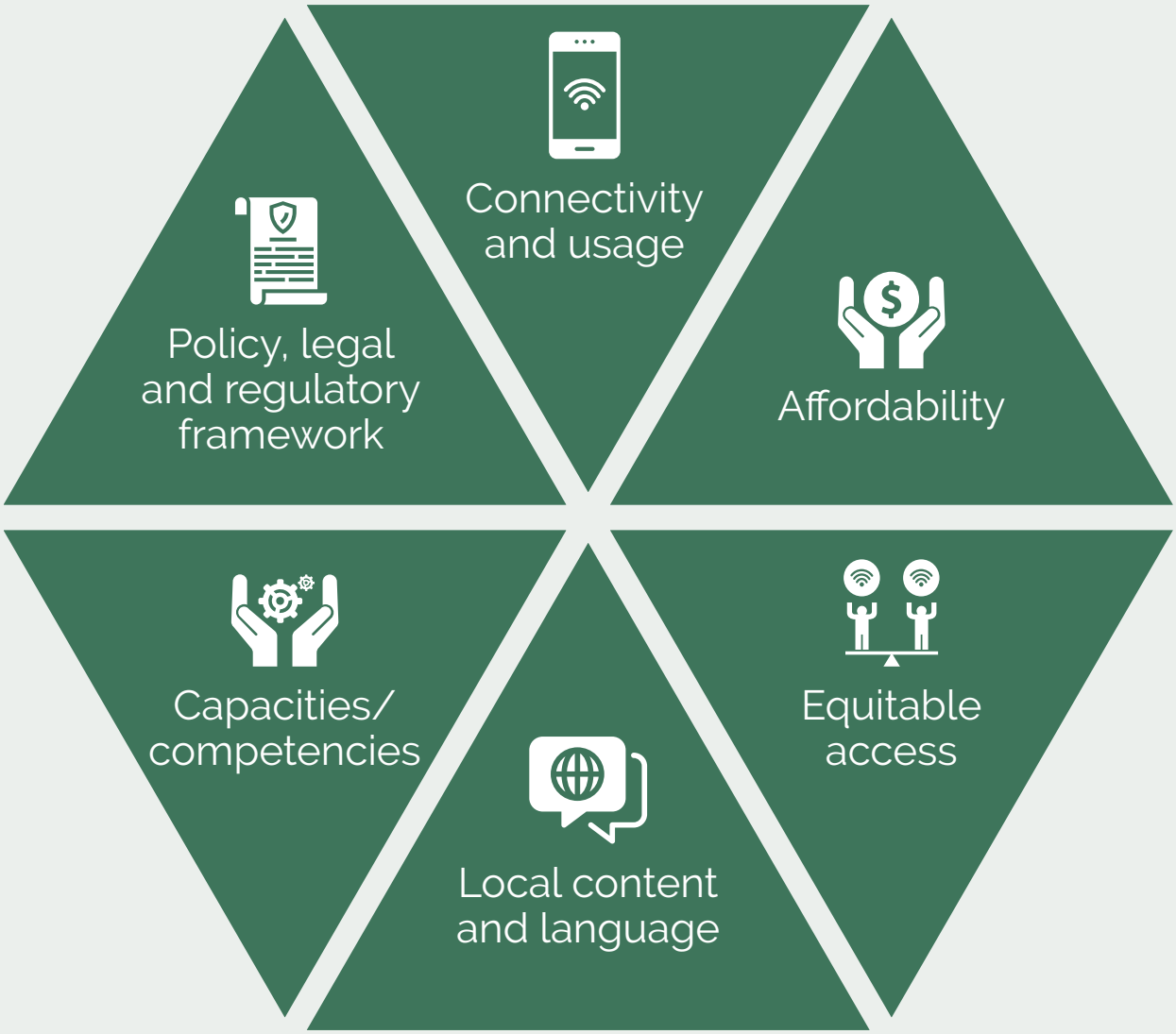
6

Category A **Accessibility to All**

Children sitting around a school in Gbiti, Cameroon, play with cellular phones that they drew. Located on the border with the Central African Republic and separated from its neighboring country by a 150-meter backwater, Gbiti is one of the three gates where Mbororo refugees enter Cameroon. Gbiti is a remote place. The first phone connection is located 18 kilometers away, without any insurance that the network is working.

A

Accessibility to All



The ability of all to access the Internet lies at the heart of Internet Universality. The reach of the Internet and Internet-enabled services has grown more rapidly than that of almost all previous communications media, particularly since the popularisation of the World Wide Web and, more recently, the emergence of mobile access to the Internet and the availability of smartphones.

Nevertheless, access to the Internet remains highly unequal. The existence of digital divides between and within regions, countries and communities has preoccupied United Nations agencies and other stakeholders since before the World Summit on the Information Society more than a decade ago.[74] The World Bank is among agencies that have expressed concern, recently, that the benefits of Internet may be accruing more to those with economic and educational advantages, thereby increasing rather than reducing inequality.[75]

The principle of Accessibility to All has technical, economic and social aspects. It reaches far beyond mere connectivity, for example, to include issues of affordability, content and capability. It is closely related within societies to the distribution of income and resources between women and men, poor and rich, rural and urban communities, language groups and ethnic minorities, and those affected by disability or marginalisation.

Technical dimensions of Accessibility to All include the availability of adequate infrastructure for connectivity and of the capacity of devices used to enable access to the higher-bandwidth services that now make up a high proportion of Internet traffic and services. Economic and social dimensions include affordability, the availability of relevant content, including content in relevant languages, and the capabilities which people have to make effective use of the Internet for their own purposes. Aspects of these point to the need for legal and regulatory frameworks which seek to enable affordable access for those living in all communities within a country. This includes the adoption of universal access policies and sustainable business models to address technical and economic differences for current and future needs.

Efforts to address digital divides cannot stand alone, but stand alongside efforts to address other structural inequalities within society, based on factors such as gender, age, education, literacy, language and disability. These are core elements of the UN's Sustainable Development Agenda.

Data concerning access need to be disaggregated if they are to be fully understood and addressed in policy and practice. The phrase 'aggregate and disaggregated' is used in many of the indicators in this category to indicate where this is particularly valuable. Where this phrase is used, assessments should pay particular attention to the accessibility of the Internet for women, children, relating findings concerning these to themes concerned with them in Category X, as well as to issues of locality, ethnicity and disability

- This category is divided into six themes concerned with different aspects of Accessibility to All.
- Theme A is concerned with the legal and regulatory framework for universal access and related issues.
- Theme B is concerned with technical and geographic connectivity.
- Theme C is concerned with the affordability of networks and services.
- Theme D addresses issues of equitable access.
- Theme E is concerned with content and language.
- Theme F is concerned with capabilities and competencies.

Many of the questions/indicators in this category make use of quantitative indicators. It should be noted, when using these, that many international data sets make use of estimations as well as empirical data which have been gathered locally. Wherever possible, data should be sourced directly from the country itself rather than from international data sets.

Quantitative data also rapidly go out of date, and care should be taken to interpret available data in the light of observable changes that are taking place in access to and use of networks, devices and services. In particular, where quantitative series are available, assessment should consider the trend in quantitative data as well as their current value. This is particularly important when considering themes such as connectivity and affordability.

Theme A • Policy, Legal and Regulatory Framework

The first theme within this category is concerned with the legal, regulatory and infrastructural framework for communications access, which provides the context within which efforts to implement accessibility for all are undertaken.

Question A.1 is concerned with the quality of measurement of access. Questions A.2, A.3 and A.4 are concerned with aspects of the legal and regulatory framework – legal provisions concerning access, the existence of a regulatory authority and the establishment of universal access policy. Question A.5 concerns the availability of access opportunities for those that cannot afford or do not otherwise have personal access.

A.1 Is statistical information concerning access and use of Internet regularly gathered by national statistical systems and/or other competent authorities, on a systematic basis?

Indicators:

- ▶ Arrangements for gathering aggregate and disaggregated statistical information, from diverse sources, including the inclusion of relevant questions in household surveys[1]
- ▶ Availability of independent household surveys and other evidence concerning aggregate Internet access and use

A.2 Are there constitutional or legal provisions concerning access the Internet and online services?

Indicator:

- Existence of a legal or regulatory entitlement to Internet access

A.3 Is there a legal or regulatory authority which seeks to implement universal access to communications and the Internet?

Indicators:

- Existence of a legal or regulatory authority concerned with universal access, and evidence concerning the use of universal access funds and mechanisms
- Stakeholder perceptions of regulatory performance concerning universal access

1 Indicators marked with a triangle have been identified as 'core indicators'. The subset of core indicators can be used to undertake less comprehensive assessments of Internet Universality where resources are insufficient for a full assessment. These core indicators can also be found in Annex 4.

A.4 Does the government have a policy and programme to implement universal access to reliable, affordable broadband, and is this effectively implemented?

Indicators:

- Adoption of a universal access strategy and evidence of effective deployment of UA resources
- Statistical evidence of progress towards universal access, aggregate and disaggregated[2]

Consideration should be given and cross-reference made to data/evidence for contextual indicator 3.D, which is concerned with the availability of electricity.

A.5 Are public access facilities available that provide access to the Internet for those who cannot afford or obtain personal access to the Internet?

Indicators:

- Inclusion of public access in universal access strategy
- Numbers of telecentres, libraries and other facilities open to the public that offer Internet access, compared with proportion of the population without personal access

Theme B • Connectivity and Usage

The availability of networks of sufficient capacity and reliability to enable people to access and use the Internet is fundamental to Accessibility for All.

Question B.1 is concerned with the physical availability of networks. Questions B.2, B.3 and B.4 are concerned with the extent to which those networks are used in practice, and with perceived barriers to access and use. Question B.5 is concerned with the scale of Internet traffic within the country.

B.1 What proportion of the population uses the Internet, with what frequency, and is this proportion growing?[3]

Indicators:

- Proportion of individuals who have ever accessed the Internet, aggregate and disaggregated
- Proportion of households with Internet access[76]
- Number of Internet users per hundred population, aggregate and disaggregated, by frequency of use[77]
- Number of social media (social networks, microblogs, messaging, user-generated video streaming)4 users per hundred population, aggregate and disaggregated
- Number of visits to social media websites (defined as above) per hundred population

2 With particular reference e.g. to gender, age, locality, ethnicity and disability

3 Disaggregation should pay particular attention to gender, age, locality, ethnicity and disability.

4 It should be noted that the incidence of social media platforms varies between countries.

B.2 Are broadband networks available in all districts of the country?[5]

Indicators:

- Percentage of population covered by fixed broadband networks, including bandwidth tiers, disaggregated between urban and rural areas and by district
- Percentage of population covered by mobile broadband signal, disaggregated by available technology/bandwidth[6] (and compared with proportion covered by mobile cellular signal) and by district
- International Internet bandwidth per Internet user[7][8]
- Domestic Internet bandwidth per Internet user, disaggregated by district
- Download speeds for mobile Internet traffic

B.3 What proportion of the population subscribes to communications/broadband services, and is this growing?[7]

Indicators:

- Percentage of individuals who own a mobile phone, aggregate and disaggregated[79]
- Number of fixed broadband subscriptions per hundred population, aggregate and disaggregated[80]
- Number of unique active mobile broadband subscribers per hundred population, by bandwidth, aggregate and disaggregated[81]
- Number of IP addresses within the country, per hundred population

B.4 What barriers to access are identified by users and non-users of the Internet?

Indicator:

- Perceptions (by users and non-users) of barriers to their Internet access and use, aggregate and disaggregated,[8] from household surveys and/or other sources.

B.5 How rapidly is the volume of Internet traffic within the country growing compared with global growth in traffic?

Indicators:

- Volume of fixed broadband Internet traffic in exabytes (including and excluding video streaming), per individual, per Internet user, and trend[82]
- Volume of mobile broadband Internet traffic in exabytes (including and excluding video streaming), per individual, per Internet user, and trend[83]

5 It should be noted that the definition of broadband varies between organisations and jurisdictions. Some still define it as any bandwidth above a floor of 256kbps and above, while others apply floors as high as 10Mbps. It is therefore important to consider the different tiers of bandwidth available where possible.

6 i.e. 2G, 3G, 4G etc.

7 Disaggregation should pay particular attention to gender, age, locality, ethnicity and disability.

8 Disaggregation should pay particular attention to gender, age, locality, ethnicity and disability.

B.6 Are affordable online services available which enable individuals and civil society organisations to make use of the Internet to access content and services or to express their views?

Indicators:

- Availability of affordable blogging and webhosting services
- Proportion of the population making use of social media and blogging services

Theme C • Affordability

Connectivity is insufficient to enable people to access and use the Internet. The extent to which they can do so also depends on its affordability. Targets for affordability have been adopted by the International Telecommunication Union (ITU),[84] the Broadband Commission for Digital Development[85] and the Alliance for Affordable Internet.[86]

Questions C.1 and C.2 are concerned with the affordability of access devices and of broadband use. Question C.3 is concerned with policy and practice to enable access to low-income segments of the population.

C.1 Are mobile handsets capable of Internet connectivity affordable to all sections of the population?[9]

Indicators:

- Cost of a) entry-level[87] mobile handset and b) smartphone as a percentage of monthly GNI *p.c.*
- Perceptions of affordability by users and non-users, aggregate and disaggregated

C.2 Is broadband[88] access and use affordable to all sections of the population?[10]

Indicators:

- Monthly cost of entry-level[89] fixed broadband connection and use as a percentage of monthly GNI *p.c.*
- Monthly cost of entry-level[90] mobile broadband connection and use as a percentage of monthly GNI *p.c.*
- Availability or otherwise of zero-rated or low-cost access

C.3 Are universal access/service arrangements in place that seek to reduce the cost of access and usage for poor and marginalised groups within the population?

Indicators:

- Evidence that universality policies and arrangements address affordability in law and practice[91]
- Availability of price packages appropriate for groups with low or variable incomes

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9 See endnote. Assessments should note different definitions of 'entry level' between countries and over time. Disaggregation should pay particular attention to gender, age, locality, ethnicity and disability.

10 See endnotes. Assessments should note different definitions of 'broadband' and 'entry level' between countries and over time.

Theme D • Equitable Access

Evidence from many countries shows that there are significant digital divides within national populations, associated with factors such as geography, gender, age, ethnicity and disability. In many cases, these are consistent with structural inequalities in society as a whole, and so with differences in access to other goods and services.

Questions in this theme are concerned with digital divides relating to geography, gender, age, ethnicity, and disability. They should be assessed in conjunction with findings for overall connectivity and usage in Theme B above, including barriers to access and usage identified by users and non-users of the Internet, and alongside those concerned with Gender and with Children in Category X. Question D.2 is also included in Theme A (Gender) of Category X.

Attention should be paid when using these indicators to intersectionality, *i.e.* the relationship between different demographic and other social and economic factors which can be identified through disaggregation.

D.1 Are there significant differences in broadband access and use between regions and between urban and rural areas?

Indicators:

- Geographical coverage of broadband networks in urban and rural areas, by level of bandwidth
- Numbers of mobile broadband subscribers and of Internet users, aggregate and where possible disaggregated between urban and rural areas and in different regions

D.2 Are there significant differences in broadband access and use between different ethnic communities within the population, including indigenous peoples?

Indicator:

- Numbers of mobile broadband subscribers and of Internet users by different ethnic communities, including indigenous peoples

D.3 Does the government survey and/or consult different groups with society, and organisations representing them, about their perceptions and use of the Internet?

Indicators:

- Existence of surveys and consultation arrangements addressed to or disaggregating between different population groups
- Perceptions of the Internet derived from household surveys and other sources, aggregate and disaggregated between population groups

D.4 Is there a gender digital divide in Internet access and use and, if so, is this gender divide growing, stable or diminishing? (This question and indicators are also included in Category X Theme A)

Indicators:

- Proportions of individuals using the Internet, disaggregated by sex, compared with differences between men and women's income and educational attainment[11]
- Proportions of adult women and men with mobile broadband subscriptions disaggregated by sex, compared with gender gaps in income and educational attainment
- Survey data on patterns of Internet use, disaggregated by sex
- Perceptions of barriers to Internet access and use, and of values of Internet access and use, disaggregated by sex

D.5 Do adults in all age groups make use of the Internet to the same extent?

Indicators:

- Proportion of adults in different age groups who are using the Internet, and frequency and type of use12, including disaggregation by sex
- Perceptions of barriers to Internet access and use, and of the value of Internet access and use to end-users (where available), disaggregated by age and sex

D.6 Are people with disabilities able to make effective use of the Internet?

Indicators:

- Existence of legal and regulatory provisions to promote access and use of Internet by people with disabilities
- Extent to which accessibility for people with disabilities is enabled on government websites and e-government services
- Proportion of those with and without disabilities who are using the Internet, by type of disability and age group
- Perceptions by people with disabilities of barriers to Internet access and use, and of the value to them of Internet access and use

11 This enables comparison of the gender digital divide with structural inequalities between women and men.

12 "Type of use" means the various activities that Internet users conduct online such as using social media, browsing web news, playing games, checking emails, etc.

Theme E • Local Content and Language

Relevant content, including content which is generated locally and concerned with local issues, is necessary if people are to use the Internet in order to improve their quality of life or livelihoods, and to contribute to national development. Defining and assessing local content is, however, problematic. People define content which they consider locally relevant in different ways. Language may be one of a number of potential indicators. Social media content posted by individuals may differ in this context from content on websites.

Questions E.1 and E.2 are concerned with the availability of locally-generated content within and about the country, and should also be assessed with reference to the proportion of individuals generating online content (Category R Question B.5).

The availability of content in languages which are used by local populations is also critical to the value of Internet access, particularly for minority language speakers. Questions E.3 and E.4 are concerned with the availability of content in local languages, and should be assessed with reference to contextual indicator 2.D.

E.1 How many Internet domains and servers are there within the country?

Indicators:

- Number of registered domains (including ccTLDs. gTLDs[92] and IDNccTLDs) per thousand population, and trend where available
- Number of secure webservers per million population, and trend where available

E.2 Is a substantial and growing volume of content about the country available online, including locally-generated content?

Indicator:

- Number of articles/words concerning the country in Wikipedia or an equivalent source,[13] compared with other countries, including source (proportion generated in-country)

E.3 Are domains and online services available which enable individuals to access and use local and indigenous scripts and languages online?

Indicators:

- Availability of Internet domains and websites in local scripts
- Availability of local languages on major online platforms
- Availability of mobile apps in local languages
- Availability of content on government websites in all languages with significant user groups within the population

13 The number of Wikipedia articles was selected as an indicator following WSIS by the Partnership on Measuring ICT for Development. Wikipedia data are freely available which facilitates monitoring and assessment. However, it should be noted, when using them, that Wikipedia access and use vary between countries and between economic and language groups within countries. Other reference sources should also be considered.

- Proportion of content generated in and read by individuals on leading online services, by language, compared with proportion of total population using each language as their principal language

E.4 Is there a substantial and growing volume of Internet content[14] in diverse local and indigenous languages, including locally-generated content?

Indicators:

- Proportion of population whose principal language and script are available on leading online services
- Availability of content on government websites in all languages with significant user groups within the population

Theme F • Capabilities / Competencies

Effective use of the Internet and Internet-enabled services requires certain capabilities and competencies on the part of users. This is important for both individuals and for businesses and organisations which seek to use the Internet for commercial and other purposes. The UN's *2030 Agenda for Sustainable Development* calls for a substantial increase in the number of people who have 'relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship.' The importance of media and information literacy to achievement of this goal is widely recognised. This includes basic literacy (which is included in the contextual indicators earlier in this volume), capabilities required for effective use of online services and applications, and technical competence at various levels.

UNESCO has an established group of media and information literacy indicators,[93] which are partly incorporated in this theme and provide a valuable resource for in-depth investigation. UNESCO has also published an *ICT Competency Framework for Teachers.*[94]

Question F.1 is concerned with educational curricula and Question 2 with government activity to promote media and information literacy throughout society. Question F.3 is concerned with the prevalence of ICT skills at different skill levels. Attention should also be paid to Category X Question C.7 which is concerned with the prevalence of the Internet within business.

F.1 Do school and higher educational curricula include training in ICTs and media and information literacy, focused on effective and safe use, and are these curricula implemented in practice?

Indicators:

- Policy concerning school curricula, including media and information literacy, intercultural dialogue and training in ICT skills
- Evidence of appropriate educational curricula at primary, secondary and tertiary levels
- Proportion of teachers in primary and secondary schools with training in ICTs or the use of ICTs in education

14 This should include text, audio and video content.

- Proportion of schools with Internet access
- Proportion of learners who have access to the Internet at school

F.2 Are media and information literacy programmes (including digital aspects) provided for adults by government or other stakeholders, and, if so, to what extent are they being used?

Indicators:

- Existence of media and information literacy programmes, and usage statistics, disaggregated by sex
- Perceptions of media and information literacy among users

F.3 What proportion of the population and the workforce is skilled in the use of ICTs?[15]

Indicators:

- Proportion of Internet users with particular Internet skills, by skill level (basic, intermediate, advanced), aggregate and disaggregated[95]
- Proportion of the workforce using ICTs in the workplace, by skill level Proportion of the workforce using ICTs in the workplace, by skill type (basic, intermediate, advanced), aggregate and disaggregated
- Proportion of tertiary education students enrolled in STEM[16] and ICT courses, disaggregated by sex, compared with global averages

15 Disaggregation should pay particular attention to sex, age, locality, ethnicity and disability.

16 i.e. science, technology, engineering and mathematics.

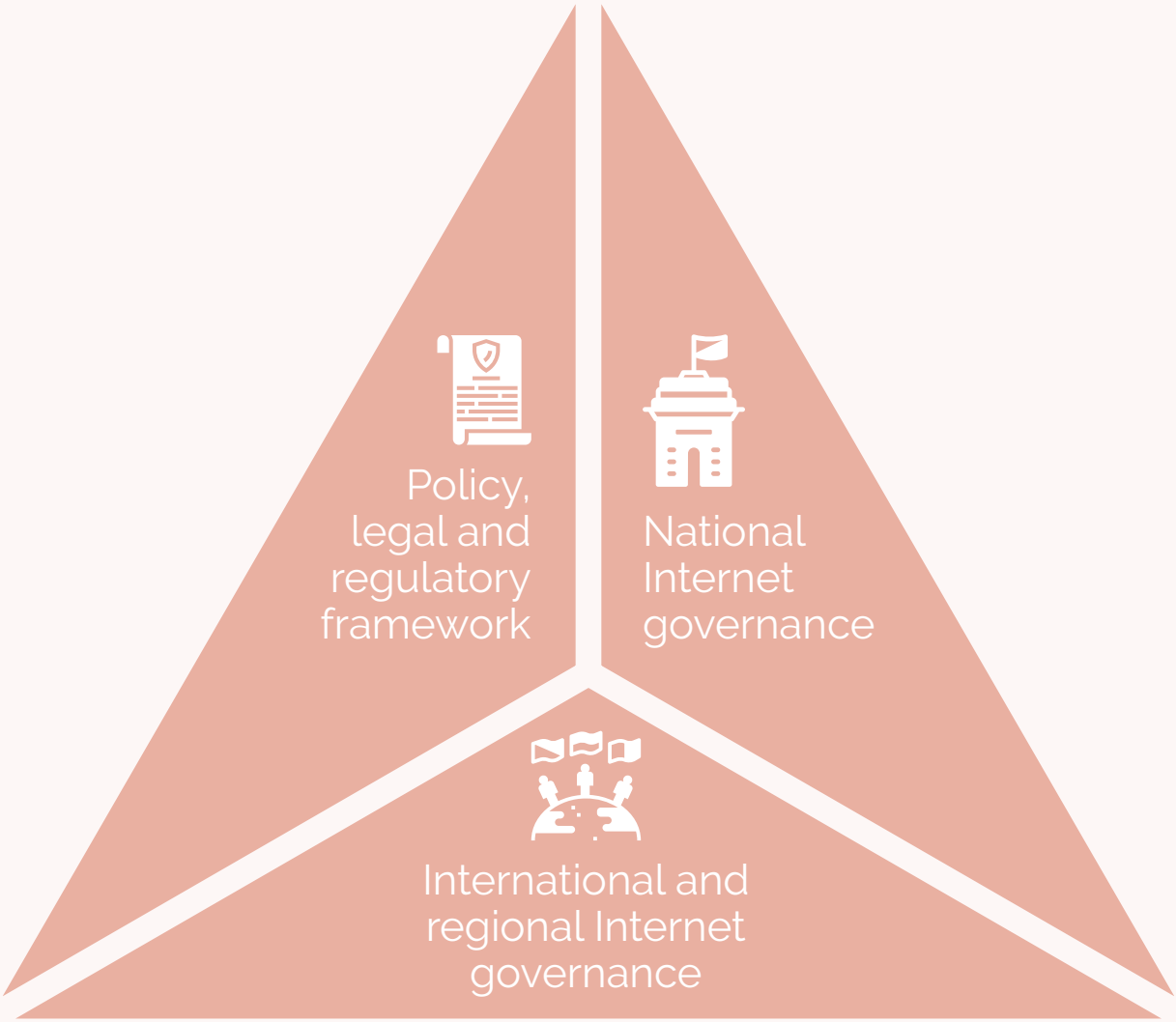
7

Category M
Multi-stakeholder participation

The 10th annual meeting of the Internet Governance Forum (IGF) was held in November 2015 in João Pessoa, Brazil. The IGF is a multistakeholder forum for policy dialogue on issues of Internet governance. It brings together all stakeholders in the Internet governance debate, whether they represent governments, the private sector or civil society, including the technical and academic community, on an equal basis and through an open and inclusive process.

M

Multistakeholder participation



The development of the Internet has been characterised by multistakeholder participation. The *Tunis Agenda for the Information Society*, adopted at the second session of the World Summit on the Information Society (WSIS) in 2005, acknowledged that 'multi-stakeholder participation is essential to the successful building of a people-centred, inclusive and development-oriented Information Society,' and encouraged 'the development of multi-stakeholder processes at the national, regional and international levels to discuss and collaborate on the expansion and diffusion of the Internet as a means to support development efforts to achieve internationally agreed development goals and objectives, including the Millennium Development Goals.'[96]

The United Nations General Assembly, in its ten-year review of WSIS outcomes in 2015, reaffirmed 'the value and principles of multi-stakeholder cooperation and engagement …, recognizing that effective participation, partnership and cooperation of Governments, the private sector, civil society, international organizations, the technical and academic communities and all other relevant stakeholders, within their respective roles and responsibilities, especially with balanced representation from developing countries, has been and continues to be vital in developing the information society.'[97]

Multistakeholder participation in the development and governance of the Internet has drawn together governments, intergovernmental and international organisations, the private sector, civil society and the Internet technical and professional community and academia. The goal of multistakeholder participation is to improve the inclusiveness and quality of decision-making by including all those who have an interest in the Internet and its impact on wider social, economic and cultural development in open and transparent decision-making processes.

The *Tunis Agenda* agreed a 'working definition' of Internet governance as 'the development and application by governments, the private sector and civil society, in their respective roles, of shared principles, norms, rules, decision-making procedures, and programmes that shape the evolution and use of the Internet.'

Multistakeholder participation has been a central principle of the Internet Governance Forum (IGF), which was established by the UN Secretary-General following WSIS, and has been widely adopted in other national, regional and international fora concerned with the Internet. It has also gained resonance beyond the Internet. The United Nations' 2030 Agenda for Sustainable Development also calls for 'multi-stakeholder partnerships' to be established 'that mobilize and share knowledge, expertise, technology and financial resources, to support the achievement of the sustainable development goals in all countries, in particular developing countries.'[98] The extent to which stakeholders do or can participate effectively is determined by a number of factors, including the extent of their awareness, interest, concern and knowledge, their level of agency or responsibility for Internet-related outcomes, and the nature of the consultative and decision-making processes involved.

This category of indicators is divided into three themes:

- Theme A is concerned with the overall legal and regulatory framework for participation in governance.
- Theme B is concerned with national Internet governance.
- Theme C is concerned with international and regional Internet governance.

Assessments of multistakeholder participation should consider both the existence of institutional arrangements and the extent to which multistakeholder participation results in practice from them. This should include an assessment of whether participation is genuinely balanced and includes the interests of all parts of the community not just those that are explicitly and directly concerned with the development of the Internet.

Theme A • Policy, Legal and Regulatory Framework

This theme is concerned with the broad national legal and regulatory framework for governance, rather than specifically with the Internet or Internet governance. This provides the overall context within which policies and decisions concerning the Internet are made. The evidence on which it is assessed, however, is drawn partly from the extent to which governance processes are available online, which also indicates the extent to which government is taking advantage of opportunities provided by the Internet.

A.1 Is there an overall policy, legal and regulatory framework for Internet development and policymaking which is consistent with international norms?

Indicators:

- ▶ Existence of an overall framework consistent with relevant international norms[99]
- ▶ Existence of legal and regulatory frameworks to enable e-commerce, digital signatures, cybersecurity, data protection and consumer protection[1]

A.2 Does the government encourage public participation in national policy processes?

Indicators:

- Value and ranking in UN DESA E-Participation Index
- Policy and legal arrangements requiring public consultation and legal and practical arrangements for online consultation processes
- Number and range of government consultation processes and opportunities available online
- Evidence of participation by diverse stakeholder groups in online consultation processes which are not Internet-related
- Evidence of participation by diverse stakeholder groups in Internet-related policy-making processes

A.3 Is government accountable to citizens and stakeholder groups?

Indicator:

- Constitutional and institutional arrangements for government accountability, and evidence from credible and authoritative sources that these are implemented in practice

1 Indicators marked with a triangle have been identified as 'core indicators'. The subset of core indicators can be used to undertake less comprehensive assessments of Internet Universality where resources are insufficient for a full assessment. These core indicators can also be found in Annex 4.

Theme B • National Internet Governance

This theme is concerned with the extent to which diverse stakeholder groups are involved in national-level policymaking concerned with the Internet. Question B.1 is concerned with the extent to which potential participants in policymaking have established their own fora for discussion. Questions B.2 and B.3 are concerned with the institutional framework for discussions, within government itself and through the national IGF format which has become widely adopted in recent years.

B.1 Are there active associations of professionals (including Internet professionals), consumers and other stakeholder groups that focus on or engage with Internet-related policy and governance issues?

Indicator:

- Existence, membership data (aggregate and disaggregated by sex) and level of activity of relevant associations

B.2 Does the government actively involve other stakeholder groups in developing national Internet policies and legislation?

Indicators:

- Existence of arrangements for multistakeholder consultation and involvement in national policymaking institutions and processes concerned with the evolution and use of the Internet
- Numbers of non-governmental stakeholders actively participating, by stakeholder group, disaggregated by sex

B.3 Is there a national Internet Governance Forum and/or other multistakeholder forum open to all stakeholders, with active participation from diverse stakeholder groups?

Indicators:

- Existence of national IGF and/or other multistakeholder forum concerned with Internet governance
- Participation data for national IGF or other fora, aggregate and disaggregated by sex and stakeholder group, with particular attention to participation by selected groups (e.g. education ministries, SMEs, NGOs concerned with children, trades unions), and including arrangements for remote participation

B.4 Does the national domain name registry involve all stakeholders in its decision-making processes?

Indicator:

- Constitution and practice of domain name registry

Theme C • International and Regional Internet Governance

This theme is concerned with the extent to which diverse stakeholder groups within the country participate in international fora concerned with Internet governance. Question C.1 concerns the extent to which government encourages multistakeholder participation in international activities. Questions C.2 and C.3 are particularly, but not exclusively, concerned with the extent to which it and other stakeholder communities actively participate in two of the most important international fora concerned with the evolution and use of the Internet, the IGF and ICANN. It will not be possible for investigations to assess participation in a wide range of Internet fora so the ITU, global and regional IGFs and ICANN have therefore been selected to reflect different aspects of the overall Internet governance environment.

C.1 Does the government actively involve other stakeholder groups in developing policy towards international Internet governance?

Indicator:

- Evidence that government encourages and facilitates multistakeholder preparation for international meetings

C.2 Do government and other stakeholders from the country actively participate in major international fora concerned with ICTs and the Internet?

Indicators:

- Number of government submissions to international fora concerned with ICTs and the Internet
- Extent of involvement by government and other stakeholders in international standard-setting processes concerned with communications and the Internet
- Number of participants from different stakeholder groups participating in global and regional IGFs, per million population, aggregated and disaggregated by stakeholder group and sex
- Participation or otherwise of non-government stakeholders in official delegations to ITU, aggregated and disaggregated by stakeholder group and sex

C.3 Does the government and do other stakeholders participate actively in ICANN?

Indicators:

- Membership of and active participation in ICANN's Governmental Advisory Committee (GAC)
- Membership of and active participation in ICANN constituencies, working groups and other fora

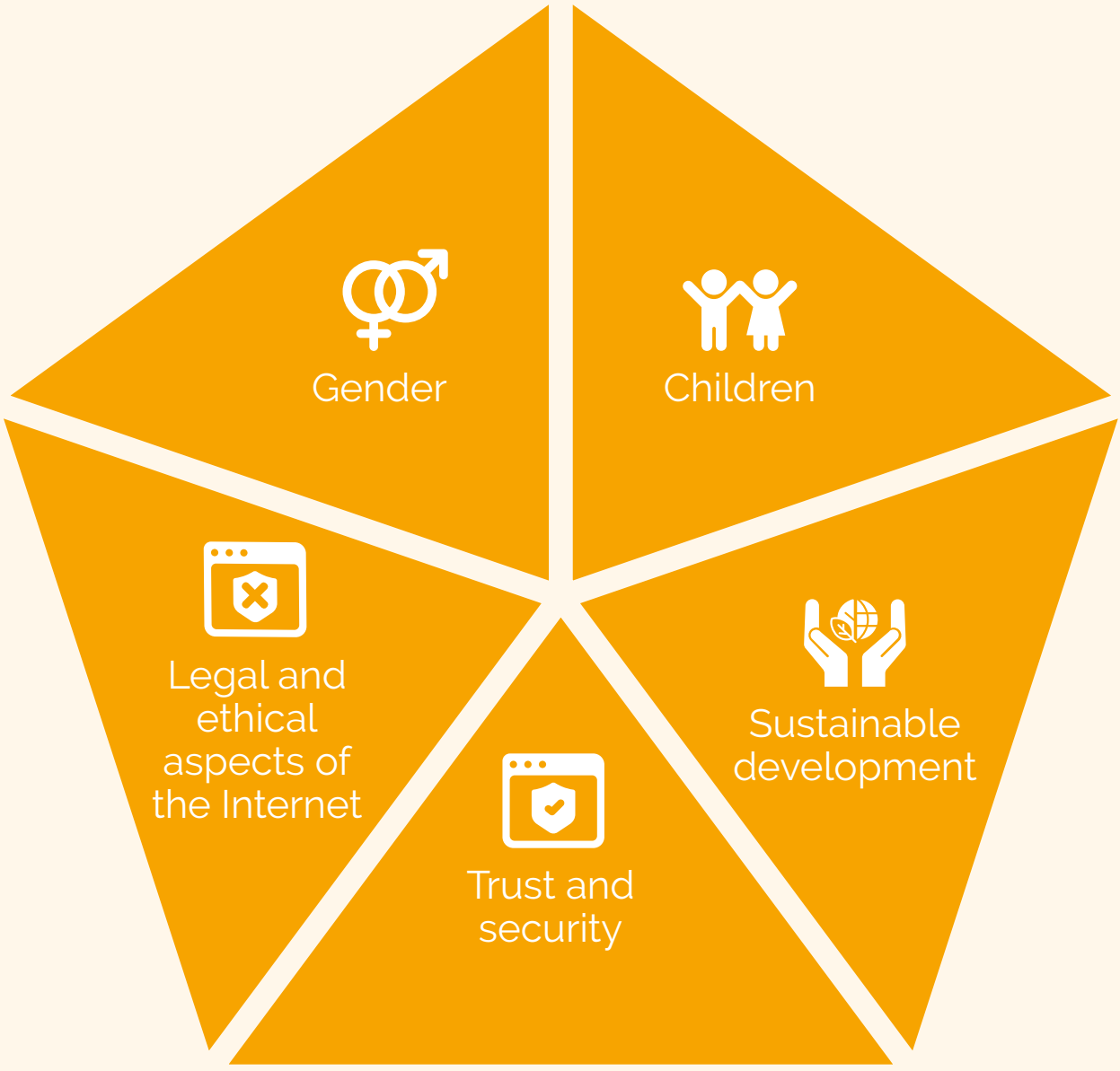
8

Category x **Cross-Cutting Indicators**

Mansoor,12, watches the virtual reality documentary 'Clouds over Sidra' outside a UNICEF-supported Makani centre in the Za'atari camp for Syrian refugees, near the Syrian border in Mafraq Governorate, Jordan, 19 January 2017. The short film depicts a day in the life of Sidra, an adolescent girl living in the camp, where children make up more than half of the population of 80,000.

X

Cross-Cutting issues



The final category included in the Internet Universality framework draws together five themes containing cross-cutting indicators.

- Theme A is concerned with gender equality.
- Theme B is concerned with children.
- Theme C is concerned with sustainable development.
- Theme D is concerned with trust and security.
- Theme E is concerned with legal and ethical aspects of the Internet.

The first two of these themes are concerned with issues of inclusion which require special attention in any assessment undertaken using the indicators. They draw attention to issues of structural inequalities within society and towards groups that often face challenges where access, adoption and use of the Internet are concerned. Assessments of Internet Universality in these contexts should also draw fully on indicators throughout the ROAM categories, particularly where these can be disaggregated by sex or age group. The indicators in Groups A and B complement and supplement those indicators, and provide a further basis for analysis, including analysis of intersectionality.

The third group of cross-cutting indicators is concerned with issues of sustainable development, including the Sustainable Development Goals (SDGs) which are included in the UN's *2030 Agenda for Sustainable Development*,[100] and the impact which the Internet is having on particular development sectors.

The fourth theme is concerned with trust and security. Without effective network security, users feel less confident that their rights, data and integrity will not be compromised, and networks will be less trusted and less universal.

The final group of cross-counting indicators (group E) is concerned with legal and ethical aspects of the Internet. There has been increasing concern in recent years about use of the Internet in ways which undermine rights and development, including criminality, sexual exploitation, racial hatred and the deliberate dissemination of misinformation. These developments challenge the effectiveness with which the Internet can be used to enhance rights and development, and need to be considered in any overall assessment of the evolving Internet environment within a country.

Theme A • Gender

ICTs are not gender neutral: they are shaped by the contexts in which they are developed and used. Women in many countries face a number of barriers in gaining access to or using the Internet, including 'concrete' barriers such as affordability and network rollout, quality and availability; 'analogue' barriers such as the availability of relevant content, structural barriers concerned with educational access and attainment, lack of relevant skills and income, occupational status, the effect of online abuse and gender-based violence and threats, and intersectional challenges including the impact of stereotypes and cultural norms on their ability to access and use the Internet.[101]

The term 'gender digital divide' is used to assess the difference between female and male participation in the information society, particularly access and use of ICTs and the Internet. Addressing the gender digital divide was identified as a priority by the UN General Assembly in its ten-year review of WSIS outcomes in 2015.[102] Although increased attention is now being paid to this divide, estimates made by the ITU suggest that the global gap between men's and women's access to the Internet is not declining.[103] The intersectionality of gender with age and other demographic characteristics should also be reflected in assessments.

UNESCO believes that a distinct analysis on gender should form part of any assessment that is made using the indicators in this framework. This should be based on data from all five categories of indicators (ROAMX). Many of the indicators in the ROAM categories – both quantitative and qualitative – should be disaggregated to provide data concerning women as compared with men. The Gender Inequality Index which is prepared by UNDP and included among the contextual indicators for this framework should be incorporated in analysis.

The questions and indicators included in this section address a number of issues that are explicitly concerned with gender differences, which supplement those addressed by questions and indicators in other Categories. Question A.1 is concerned with government policies on gender and ICTs/Internet. Questions A.2, A.3, and A.4 are concerned with the gender digital divide. (Question A.2 is also included in Theme D (Equitable Access) of Category A.) Questions A.5 to A.7 are considered with additional dimensions of women's experience of the Internet – gender-based harassment and violence, training and employment, and information concerning reproductive and sexual health.

A.1 Are the interests and needs of women and girls explicitly included in national strategies and policies for Internet development, and effectively monitored?

Indicators:

- National strategies include explicit consideration of a) women's needs relating to the Internet and b) the potential of the Internet to support women's empowerment and gender equality[1]
- Numbers of women and men in senior policymaking positions in government concerned with ICTs/Internet
- Extent of disaggregation of available data on ICT access and use by sex
- Existence of national mechanisms to monitor women's inclusion in strategies for Internet access and use

A.2 Is there a gender digital divide in Internet access and use and, if so, is this gender divide growing, stable or diminishing? (This question and some of its indicators are also included in Category A Theme D)

Indicators:

- Proportions of individuals using the Internet, disaggregated by sex, compared with gender gaps in income and educational attainment
- Proportions of adult women and men with mobile broadband subscriptions disaggregated by sex, compared with gender gaps in income and educational attainment
- Survey data on Internet awareness and on patterns of Internet use, disaggregated by sex
- Perceptions of barriers to Internet access and use, and of the value of Internet access and use, disaggregated by sex

A.3 Do social and cultural barriers to access and use of the Internet affect women's ability to access and use the Internet?

Indicator:

- Perceptions of barriers to Internet access and use, and of the value of Internet access and use, disaggregated by sex

1 Indicators marked with a triangle have been identified as 'core indicators'. The subset of core indicators can be used to undertake less comprehensive assessments of Internet Universality where resources are insufficient for a full assessment. These core indicators can also be found in Annex 4.

A.4 Do women and men participate to the same degree in use of online services?

Indicators:

- Proportion of Internet users using social media networks, disaggregated by sex
- Proportion of adults using mobile financial and online banking services, disaggregated by sex
- Proportion of adults using e-government services, disaggregated by sex
- Proportion of adults using electronic shopping services, disaggregated by sex

A.5 Do the law, law enforcement and judicial processes protect women and girls against online gender-based harassment and violence?

Indicators:

- Existence of a relevant legal framework and judicial processes
- Incidence of online gender-based harassment and violence experienced by women and girls
- Evidence of government, law enforcement and judicial action to provide protection to women against online gender-based harassment and violence
- Existence of online services which are intended to protect women against online gender-based harassment or support those affected by it

A.6 Is the proportion of women in STEM training, employment and Internet leadership significant and growing?

Indicators:

- Proportion of women enrolled in and graduating from STEM courses in higher education
- Proportion of women in STEM employment, by level of skill
- Proportion of women in senior management positions in Internet/communications businesses at national level

A.7 Is accurate information about reproductive and sexual health freely available online?[2]

Indicator:

- Presence and/or absence of restrictions on online information about reproductive and sexual health, ease of access (including language) and extent of use

2 This is included as a sample area of content of particular relevance to women.

Theme B • Children

The Convention on the Rights of the Child defines as children 'every human being below the age of eighteen years unless under the law applicable to the child, majority is attained earlier.'[104] This is the definition for childhood which is recommended in these indicators. Some variation in age definition may be required because of different ages of majority in different countries.

Children are increasingly coming into contact with the Internet at an early age. The Internet has great potential to enable them to access information that they need and cannot readily obtain by other means, to participate in social groups, and to express their wishes, hopes and needs. At the same time, there is widespread concern at threats to children's wellbeing which may be facilitated by the Internet, including exposure to content which they may find disturbing or addictive, sexual predation, harassment, bullying and manipulative advertising. Initiatives such as Global Kids Online and agencies including UNICEF are working to establish ways of promoting the opportunities which Internet access and use open up for children while protecting them from harm.

Questions B.1 to B.3 are concerned with children's experience of the Internet. Questions B.4 to B.7 are concerned with government policy (B.4), education (B.5 and B.6), and child protection (B.6).

The interests of children should be considered across the whole of this indicator framework, including questions concerned with policy and legal frameworks as well as quantitative and qualitative outcomes. Issues such as the right to privacy and right to access information have particular implications and requirements where children are concerned. Where policies are concerned, it is also important to consider whether these are mainstreamed into broader policies that deal with wider issues (such as broadband access and the digital economy), and not just to consider policies that relate explicitly to children.

B.1 Does the government survey children or consult them and/or parents (and organisations concerned with children) about their use of the Internet?

Indicator:

- Existence of surveys and consultation arrangements explicitly addressed to children and relevant organisations

B.2 What proportion of children aged between 5 and 18 make use of the Internet?[3]

Indicator:

- Proportions of children making use of the Internet, aggregate and disaggregated by sex and age group, including frequency and type of use[4]

3 Article 1 of the CRC defines a child as 'every human being below the age of eighteen years unless under the law applicable to the child, majority is attained earlier.'

4 "Type of use" means the various activities that Internet users conduct online such as using social media, browsing web news, playing games, checking emails, etc.

B.3 How do children perceive and use the Internet?[5]

Indicators:

- Perceptions of the Internet among children derived from surveys, including barriers to use, value of use and fears concerning use, aggregate and disaggregated
- Data on use of the Internet by children, aggregate and disaggregated, compared with other age groups (e.g. data on location, frequency and type of use[6])

B.4 Is there a legal and policy framework to promote and protect the interests of children online, and is this effectively implemented?

Indicator:

- Existence of a policy framework and legal protections consistent with the Convention on the Rights of the Child (CRC), and evidence that this is implemented by government and other competent authorities

B.5 Do primary and secondary schools have Internet and broadband access?

Indicators:

- Proportions of schools with broadband and Internet access, disaggregated by tier (primary/secondary), status (public/private) and location (rural/urban)
- Learner to computer-device ratio in schools, disaggregated by tier (primary/secondary), status (public/private) and location (rural/urban)

B.6 Do government and educational institutions support digital dimensions of media and information literacy with respect to children's effective and safe use of the Internet?

Indicators:

- Existence of government programmes to promote digital literacy and awareness of Internet safety and responsible use of the Internet among children
- Evidence of educational curricula concerned with digital literacy, including effective and safe use of Internet
- Availability of online services to support children's use of the Internet, including child protection services accessible by children
- Usage data of online services to support children's use of the Internet, including child protection services accessible by children

5 Disaggregation should pay particular attention to gender, age, locality, ethnicity and disability.

6 "Type of use" means the various activities that Internet users conduct online such as using social media, browsing web news, playing games, checking emails, etc.

Theme C • Sustainable Development

Information and communication technologies, including the Internet, have been expected to make an important contribution to social and economic development since before the World Summit on the Information Society in the early years of this century. Understanding the impact of the Internet on development is an important dimension of any assessment of a national Internet environment.

The United Nations' *2030 Agenda for Sustainable Development* sets out the global framework for international action on development for the fifteen years from 2015 to 2030, including seventeen Sustainable Development Goals (SDGs).[105] The Agenda notes that 'The spread of information and communications technology and global interconnectedness has great potential to accelerate human progress, to bridge the digital divide and to develop knowledge societies,' and its Goal 9(c) accordingly calls for the international community 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.'

Questions C.1 to C.3 are concerned with government policies relating to the Internet and the Sustainable Development Agenda. Questions C.4 to C.7 are concerned with the impact of the Internet on particular development sectors.

C.1 Do national and sectoral development policies and strategies for sustainable development effectively incorporate ICTs, broadband and the Internet?

Indicators:

- Existence of a recent, comprehensive policy for the development of ICTs, broadband and the Internet, which includes consideration of likely future developments in these fields
- Inclusion of recently developed or updated policies and strategies for broadband and the Internet in national strategies to monitor and achieve the UN's *2030 Agenda for Sustainable Development* and Sustainable Development Goals (SDGs)
- Inclusion of recently developed or updated policies and strategies for broadband and the Internet in selected economic and social sectors (such as enterprise, agriculture, education, health)

C.2 Does the government have an agreed policy on the management of e-waste and is this implemented effectively?

Indicators:

- Existence of a national policy on e-waste, and evidence concerning implementation by government and private companies
- E-waste collection rate

C.3 Are there adequate arrangements in place for monitoring and assessment of the development of the Internet and its impact on society?

Indicators:

- Existence of national statistical office
- Arrangements for statistical monitoring of Internet access and use, including household surveys
- Arrangements for regular review and revision of policies relating to the Internet and its impact on sustainable development

C.4 Does the government have a long-term strategy to address new developments in information technology and incorporate these in development, with multistakeholder participation?

Indicator:

- Existence and composition of a strategic forum or equivalent addressing new developments in information technology including artificial intelligence

C.5 What proportion of adults makes use of major online services?

Indicators:

- Proportion of adults using e-government services in specific categories, aggregate and disaggregated
- Proportion of adults using a) online banking and b) mobile financial services, aggregate and disaggregated
- Proportion of adults using online learning services
- Proportion of adults using online health services
- Proportion of adults using online shopping services

C.6 What proportion of public service facilities have Internet access?

Indicators:

- Proportion of primary schools with Internet access
- Proportion of libraries with Internet access
- Proportion of health clinics with Internet access

C.7 What proportion of businesses, including small and medium sized businesses make use of the Internet and e-commerce?

Indicators:

- Proportion of business-to-business activity undertaken through e-commerce
- ▶ Proportion of SMEs using the Internet, by type of access
- Proportion of SMEs trading (and exporting) online
- Volume of business-to-business and business-to-consumer activity as a proportion of total relevant activity
- ▶ Perceptions of the value of Internet use by SMEs

Theme D • Trust and Security

Trust and security in the integrity of the Internet and Internet-enabled services are essential for the Internet to function effectively and in the interests of all. Users and potential users who do not feel that the Internet is secure will be inhibited from making full and effective use of it. Risks and anxieties concerning trust and security may particularly deter disadvantaged groups within society.

Cybersecurity – which is understood here broadly as the protection of the Internet, online services and service users from efforts made to harm them – has become an increasingly important part of ensuring Internet Universality, requiring the attention of all stakeholders.[7] Without effective network security, users feel less confident that their rights, data and integrity will not be compromised, and networks will be less trusted and less universal. As understood in these indicators, the term cybersecurity encompasses the threats to businesses and individuals posed by cybercrime[8] and threats to critical infrastructure and databases. These threats may come from diverse sources, including governments, non-state actors, criminal organisations and individuals. Many governments have developed strategies to counteract these risks, including the establishment of computer emergency response teams (CERTs).

Questions D.1 and D.2 are concerned with the legal and regulatory framework for cybersecurity as it affects the network and its users. Question D.3 is concerned with the extent to which trust and security issues pose a problem in the country. Questions D.4 and D.5 are concerned with individuals' and businesses' perceptions and responses to network security. Issues concerning personal harassment and with misinformation, which are sometimes considered alongside cybersecurity, are, however, addressed in Theme E below.

D.1 Is there a national cybersecurity strategy, with multistakeholder engagement and aligned with international human rights standards, including a national computer emergency response team (CERT) or equivalent?

Indicators:

- Existence of cybersecurity strategy, with multistakeholder involvement, which is consistent with international rights and norms
- Establishment of national CERT or equivalent, and evidence concerning its effectiveness

D.2 Is there a framework for the investigation of cybercrime and other crimes involving computer systems which is consistent with international and regional rights agreements, laws and standards?

Indicator:

- Existence of legal framework for investigation and online evidence concerning the investigation of cybercrime and other crimes

7 Definitions of cybersecurity can vary, and researchers should therefore indicate what interpretation they are giving to the concept.

8 Definitions of cybercrime can vary. Assessments should refer both to national legal frameworks and to international agreements such as those reached by the UN Office on Drugs and Crime (UNODC).

D.3 Is there a legal and regulatory framework for consumer rights online which gives adequate protection for e-commerce customers?

Indicators:

- Existence of an established legal framework and evidence concerning compliance by businesses and implementation by government and other competent authorities
- Number (and trend) of complaints, prosecutions and civil cases related to online consumer protection
- Perceptions of the adequacy of protection against online fraud and criminality

D.4 Have there been significant breaches of cybersecurity in the country within the last three years?

Indicators:

- Incidence and nature of breaches reported, and numbers of individuals and businesses affected
- Perceptions of Internet security among users, businesses and other stakeholder groups
- Data concerning phishing, spam and bots in national level domains

D.5 Are individuals and businesses sufficiently aware of cybersecurity and taking action to reduce risks to security and privacy?

Indicators:

- Existence of a cybersecurity awareness programme implemented by government or other competent authority
- Number of personnel in government and business with cybersecurity skills
- Evidence of business awareness of and contingency plans to counteract cybersecurity attacks, including the protection of data which they hold on individuals
- Number of secure Internet servers per million population, currently and over time
- Proportions of Internet users with up-to-date malware protection
- Extent to which encryption services are used by individuals and businesses

Consideration should be given and cross-reference made to data/evidence for Category R Question E.5, which is concerned with law and practice concerning encryption and anonymity.

Theme E • Legal and Ethical Aspects of the Internet

There has been increasing concern about the use of the Internet in ways that adversely affect individual users or potentially undermine trust and confidence in the Internet. These include concerns about criminality, fraud and identity theft; harassment and sexual abuse; hate speech inciting hostility, discrimination or violence, concerned with race, religion, gender, disability and other personal characteristics; and the use of the Internet to spread 'fake news', misrepresentations or distortions (including false documents and distorted images) and propaganda.[106] These concerns, and the challenges that underlie them, should also be considered within the Internet Universality framework.

Many of the issues which arise in this context have both legal and ethical implications. National legal frameworks concerned with online and offline criminality, harassment and discrimination also vary significantly between countries, for reasons which may include challenges that are specific to individual countries such as post-conflict reconciliation.

Questions E.1 and E.2 are concerned with government and multistakeholder consideration of these aspects of the Internet. Question E.3 is concerned with overall perceptions of the Internet by individuals, and questions E.4 to E.6 with perceptions of particular issues. Disaggregation and trend data are of particular significance in these latter questions.

E.1 Is there a national policy framework concerned with legal and ethical challenges raised by usage of the Internet which is consistent with international and regional rights agreements, laws and standards?

Indicator:

- Existence and assessment of national policy or legal frameworks concerned with incitement to hatred, discrimination and violence, and to other ethical challenges, online and offline that are consistent with international and regional rights agreements, laws and standards

E.2 Are there any multistakeholder or private sector self-regulatory bodies concerned with ethical aspects of the Internet?

Indicator:

- Existence or otherwise of relevant multistakeholder or self-regulatory bodies

E.3 How do individuals perceive the benefits, risks and impact of the Internet within the country?

Indicator:

- Perceptions of the benefits, risks and impact of the Internet, derived from household or opinion surveys, disaggregated by sex

E.4 Do Internet users report experiencing significant harassment or abuse at the hands of other Internet users which deters them from making full use of the Internet?

Indicators:

- Availability of reporting mechanisms for online harassment or abuse, including reporting arrangements by online service providers
- Data on the extent to which Internet users report harassment or abuse, with particular attention to specific demographic and social groups (including women, ethnic and other minorities, and civil activists)

E.5 Do Internet users in the country experience activities defined as cybercrime or Internet-enabled crime in national law?

Indicators:

- Definition of cybercrime and Internet-enabled crime in national law
- Number and trend of prosecutions for activities defined as cybercrime in national law
- Perceptions of the Internet and Internet content derived from household or opinion surveys and other sources

E.6 Do individuals believe that the content of online sources of information is determined or manipulated by the government, foreign governments, commercial or partisan interests?

Indicators:

- Evidence from credible and authoritative sources of government or other stakeholders concerning the quality and reliability of online information, the extent to which information is manipulated, and assessments of the prevalence and impact disinformation
- Perceptions of the Internet and Internet content derived from household or opinion surveys

9

Sources and Means of Verification

On 19 January 2017 in Jordan, cellphones, chargers, adapters and other electronic equipment sit in a solar kiosk in the Za'atari camp for Syrian refugees, in Mafraq Governorate, near the Syrian border. The kiosk provides Internet connectivity and is equipped with tablets and computers. It also serves as a charging station for cellphones and other electronics equipment, and as an e-learning centre for children and youths in the camp.

This chapter begins with a brief list of sources of guidance concerning research methodology and ethics.

Sources for the contextual indicators listed in Chapter 3 are included in that chapter and its associated endnotes.

This chapter is concerned with sources and means of verification which may be used in assessments of the indicators in each of the five ROAM Categories which are set out in Chapters 4 to 8. Those listed here are those which will be generally available. In each country, there will be additional sources which will be identified in the course of investigations. The following pages should therefore be considered as a guide rather than a comprehensive reference source.

It should be noted that international sources often contain more data on developed and middle-income developing countries than they do on LDCs and other low-income countries. For this reason, assessment may rely more on quantitative evidence in some countries and more on qualitative evidence in others.

Sources Concerning Research Methodology

The indicator framework set out in this document covers a wide range of sources and methodologies, including quantitative and qualitative sources of many different kinds. There is an extensive range of methodological literature on which researchers on which draw in order to maximise the effectiveness of their assessments. A number of sources of this kind are indicated below. It is envisaged that a practical handbook to support researchers and assessments using the indicators would be helpful.

Researchers should also comply with ethical conventions concerning research methodology. The collection, analysis and reporting of data have potential implications for a number of human rights including the right of access to information and the right to privacy, and are also affected by international norms and national legislation in areas such as data protection. Researchers should take care to comply with standard ethical principles concerned with research methodology and with relevant national laws and regulations.

The following texts provide useful background information concerning research methodology and ethics.

- Agresti; C. Franklin & Klingenberg, B. (2017). *Statistics: The Art and Science of Learning from Data* (4th Ed.);[107]
- P. Alasuutari, L. Bickman, J. Brannan & J. Brannen (2008). *The SAGE Handbook of Social Research Methods*;[108]
- R. M. Groves, F. J. Fowler, M. P. Couper, J. M. Lepkowski, E. Singer & R. Tourangeau (2009). *Survey Methodology*;[109]
- UNHCHR (2012). *Human Rights Indicators: A Guide to Measurement and Implementation.*[110]

Sources for Indicators

The remainder of this chapter is concerned with sources for specific questions and indicators within the ROAMX framework.

Category R • Rights

General

- The international legal framework for human rights is established in the six documents identified in the introduction to this theme:
- the Universal Declaration of Human Rights (UDHR)[111]
- the International Covenant on Civil and Political Rights (ICCPR)[112]
- the International Covenant on Economic, Social and Cultural Rights (ICESCR)[113]
- the Convention on the Elimination of All Forms of Racial Discrimination (ICERD)[114]
- the Convention on the Elimination of Discrimination against Women (CEDAW)[115]
- the Convention on the Rights of the Child (CRC)[116]

The United Nations General Assembly has agreed that 'the same rights that people have offline must also be protected online.'[117] This and other aspects of human rights online are discussed in the UN Human Rights Council's 2016 resolution on *The Promotion, Protection and Enjoyment of Human Rights on the Internet*, 2016.[118]

The following regional rights agreements are relevant to their particular regions:

- the American Convention on Human Rights[119]
- the African Charter on Human and Peoples' Rights[120]
- the Arab Charter on Human Rights[121]
- the European Convention for the Protection of Human Rights and Fundamental Freedoms[122]

A number of UNESCO reports and resolutions address general issues concerning the Internet and rights, including:

- *CONNECTing the Dots*, conference outcome document, 2015[123]
- *Keystones to Foster Inclusive Knowledge Societies*, 2015[124]
- *Renewing the Knowledge Societies Vision for Peace and Sustainable Development*, 2013[125]
- *Internet Freedom* series of reports[126]

International and regional instruments agreed by UNESCO can also be found online.[127]

Indicator frameworks for the assessment of national rights frameworks have been developed by a number of organisations, including:

- Council of Europe, *Internet Freedom Indicators* (section on an enabling policy environment)[128]
- Freedom House, *Freedom on the Net*[129]
- World Economic Forum, *Networked Readiness Index*, 2016 – e.g. environment sub-index[130]

Comparative assessments of the national human rights environment and legal framework in different countries are made by a number of intergovernmental and non-governmental agencies including:

- Freedom House, *Freedom on the Net* country assessments[131]
- Reporters Without Borders, *World Press Freedom Index*[132]
- V-Dem Institute, *Varieties of Democracy* – e.g. the electoral democracy index and the expanded freedom of expression indicators[133]

- World Economic Forum, *Networked Readiness Index*, – e.g. environment sub-index[134]

Other information on developments concerning rights online can be found in:

- Internet and Jurisdiction project, Retrospect Database[135]
- Managing Alternatives for Privacy, Property and Internet Governance, MAPPING Policy Observatory[136]

Theme A • Policy, Legal and Regulatory Framework

Evidence concerning the legal frameworks and enforcement of human rights in individual countries may be sought from:

- official publications (including constitutional and legal instruments)
- country information pages on the website of the UN High Commissioner for Human Rights (OHCHR)[137]
- reports by national human rights committees and councils
- media reports and academic studies
- transparency reports published by online platforms and other media companies
- evidence from legal judgements and court records (and media reports concerning these)
- information from credible and authoritative informants

Additional evidence concerning training of judges and legal professionals (A5) may be sought from:

- court authorities and associations of legal professionals
- fact-finding and training feedback reports of the International Bar Association[138]
- International Bar Association reports on aspects related to the rule of law[139]
- UNODC, *Cybercrime Repository* (database) – e.g. database of cybercrime legislation, lessons learned, case law database[140]
- UNODC, *Comprehensive Study on Cybercrime*, 2013[141]
- International Association of Prosecutors, *Global Prosecutors e-Crime Network* – training and database of best practices[142]

Theme B • Freedom of Expression

Evidence concerning the legal frameworks and enforcement of human rights in individual countries may be sought from:

- official publications, including reports of media regulatory agencies
- country information pages on the website of the UN High Commissioner for Human Rights (OHCHR)[143]
- reports by national human rights committees and councils and media regulatory councils
- legal precedents and judgements
- media reports and academic studies
- transparency reports published by online platforms and other media companies
- information from credible and authoritative informants

Additional evidence concerning the legal framework, implementation and exercise of freedom of expression in individual countries may be obtained from:

- Akamai, *State of the Internet* index[144]
- Article 19's repository of information on legal and policy developments of relevance to freedom of expression in individual countries[145]
- Assessments of national legal frameworks by the Global Network Initiative[146]
- DW Akademie, Model on Digital Participation[147]
- Open Technology Institute, Ranking Digital Rights *Corporate Accountability Index*[148]
- Reporters Without Borders, *World Press Freedom Index*,[149] e.g. indicators legislative framework
- *Varieties of Democracy* (V-Dem) (annual) – e.g. the electoral democracy index and the expanded freedom of expression indicators[150]

Additional evidence concerning the proportion of the population generating online content and the costs of online services (B6-B7)can be sought from social media and online service providers, and from regulatory authorities.

Additional evidence concerning the environment for journalists can be sought from the above sources and by using relevant Media Development Indicators.[151]

Theme C • Right of Access to Information

Evidence concerning indicators in this theme can be obtained from:

- official publications, including reports of media regulatory and data protection agencies
- country information pages on the website of the UN High Commissioner for Human Rights (OHCHR)[152]
- reports by national human rights committees and councils
- legal precedents and judgements
- media reports and academic studies
- transparency reports published by online platforms and other media companies
- information from credible and authoritative informants

Additional evidence concerning the legal framework, implementation and exercise of freedom of expression in individual countries may be obtained from the international indices and resources identified for Theme B.

Theme D • Freedom of Association and the Right to Participate in Public Life

Evidence concerning all of the indicators in this theme can be obtained from:

- official publications and reports
- country information pages on the website of the UN High Commissioner for Human Rights (OHCHR)[153]
- reports by national human rights committees and councils
- reports by civil society organisations
- media reports and academic studies
- information from credible and authoritative informants

Additional evidence concerning e-government, e-participation and government websites and online resources in individual countries (D3-D4) may be obtained from a variety of sources including:

- UN, *E-Government Survey*, 2016 – e.g. online service index[154]
- UN, *E-Participation Index*, 2015 – e.g. e-consultation and e-decision-making[155]
- World Economic Forum, *Networked Readiness Index*, 2016 – e.g. environment sub-index and usage/government usage sub-index[156]
- World Justice Project, *Open Government Index* – e.g. civic participation sub-section[157]

Additional evidence concerning civil society organisation in individual countries (D2) may be obtained from a variety of sources including:

- reports by civil society organisations and informants
- World Justice Project, *Open Government Index* – e.g. civic participation sub-section[158]
- World Wide Web Foundation, Open Data Barometer (2016) – e.g. citizen and civil society sub-section[159]

Theme E • Right to Privacy

Evidence concerning all of the indicators in this theme can be obtained from:

- official publications and reports, including reports of national data protection or equivalent authorities
- country information pages on the website of the UN High Commissioner for Human Rights (OHCHR)[160]
- reports by national human rights committees and councils
- legal precedents and judgements
- media reports, academic studies and reports by civil society organisations
- transparency reports published by online platforms and other media companies
- information from credible and authoritative informants

Indicator frameworks and comparative assessments concerning national environments for privacy have been developed by a number of organisations, including:

- Breach Level Index, *Data Breach Statistics*[161]
- Council of Europe, *Internet Freedom* indicators (appendix to Recommendation CM/Rec (2016)5) – specifically subsection 4 on right to private and family life[162]
- DW Akademie, Model on Digital Participation[163]
- Freedom House, *Freedom on the Net* (annual) – specifically *violations of user rights* section – no 5 and 6[164]
- Privacy International, *State of Privacy* briefings (annual) – e.g. data protection laws and accountability measures[165]

- UNCTAD, *Global Cyberlaw Tracker* (interactive database), 2018 – see *Data Protection and Privacy Legislation Worldwide* section[166]
- UN Special Rapporteur on Freedom of Expression, Frank la Rue & APC's *Monitoring Framework on Freedom of Expression Online*, 2013[167]

Theme F • Social, Economic and Cultural Rights

Evidence concerning all of the indicators in this theme can be obtained from:

- official publications, including national development strategies and reports of government departments concerned with development and with the selected areas of employment, health and education
- reports by development agencies and civil society organisations, particularly those concerned with the selected areas of employment, health and education (for example, trades unions)
- media reports and academic studies
- information from credible and authoritative informants

The following UNESCO conventions, recommendations and other resources are relevant to this theme:

- Convention on the Protection and Promotion of the Diversity of Cultural Expressions, 2005[168]
- Convention for the Safeguarding of the Intangible Cultural Heritage, 2003[169]
- Recommendation concerning the preservation of, and access to, documentary heritage including in digital form, 2015[170]
- Recommendation concerning the Promotion and Use of Multilingualism and Universal Access to Cyberspace, 2003[171]
- UNESCO Charter on the Preservation of the Digital Heritage, 2003[172]

The United Nations' Sustainable Development Goals are included in the *2030 Agenda for Sustainable Development*.[173] These are concerned with development in general. Goal 3 is concerned with health, Goal 4 with education and Goal 8 with employment. Goal 5 is concerned with issues of gender equity.

The International Labour Organisation is the UN agency concerned with employment. It is undertaking a programme of work on *The Future of Work* which is relevant to this framework,[174] and is also a source of statistics on employment.[175]

The World Health Organisation is the UN agency concerned with health. Its *Global E-Health Observatory* undertakes regular surveys of e-health activities compiling data from different countries.[176]

The UNESCO Institute for Statistics compiles comparative data on educational experience in different countries.[177]

Additional evidence concerning participation in online activities in may be obtained from official statistics concerning Internet access and use, household surveys and other sources identified for Category A, particularly Themes A and D.

Category O • Openness

General

The following international agreement is concerned with policy, legal and regulatory frameworks for openness on the Internet:

- Open Government Partnership, *Open Government Declaration*[178]

Other general resources concerned with policy, legal and regulatory frameworks for openness include:

- Budapest Open Access Initiative[179]
- SPARC, various resources[180]

The following UNESCO reports contain relevant information:

- *Privacy, Free Expression and Transparency*, 2016[181]
- *Fostering Freedom Online: the Role of Internet Intermediaries*, 2014[182]
- *Principles for governing the Internet: a comparative analysis*, 2013[183]
- *Freedom of connection, freedom of expression: the changing legal and regulatory ecology shaping the Internet*, 2011[184]

Theme A • Policy, Legal, and Regulatory Framework

Evidence concerning all of the indicators in this theme can be obtained from:

- official publications, including national development strategies and reports of government departments concerned with innovation and information technology
- reports by development agencies and business organisations
- media reports and academic studies
- information from credible and authoritative informants, including Internet businesses

International indicator frameworks and data sets concerned with the policy, legal and regulatory framework for openness include:

- Carnegie Cyber Policy Initiative, *Cyber Norms Index*[185]

- UNCTAD, *Global Cyberlaw Tracker*[186]
- World Economic Forum, *Networked Readiness Index* – e.g. environment sub-index[187]

Theme B • Open Standards

Evidence concerning the indicators in this theme can be obtained from:

- official publications, including national development strategies and reports of government departments concerned with innovation and information technology
- international and national standard-setting and oversight authorities
- Internet professional associations, including Internet Society chapter, and business organisations
- media reports and academic studies
- information from credible and authoritative informants, including Internet businesses

Additional information concerning standards concerned with accessibility for people with disabilities (B4) can be sought from disability associations and civil society organisations.

Additional information concerning Internet protocols and standards can be sought from ICANN and the relevant Regional Internet Registry (RIR), national domain registries and agencies concerned with cybersecurity.

International documents and norms concerned with open standards include:

- APNIC, DNSSEC global validation map[188]
- Carnegie Cyber Policy Initiative, *Cyber Norms Index*[189]
- Internet Society, DNSSEC deployment maps[190]
- Internet Society, collection of IPv6 deployment data[191]
- Network World, map of countries with open source laws[192]
- Open Knowledge International, *Global Open Data Index*[193]
- Open Stand, *The Modern Paradigm for Standards*[194]
- OSS Watch (concerned with open source software)[195]

Theme C • Open Markets

Evidence concerning the indicators in this theme can be obtained from:

- government departments and regulatory authorities concerned with communications and the Internet
- opinion/perception surveys and focus groups of businesses, households and individual users
- national communications regulators
- communications and Internet businesses
- the national domain name registry
- Internet Exchange Points
- media reports and academic studies
- information from credible and authoritative informants, including Internet businesses

International documents and data sets concerned with open markets include:

- DW Akademie, Model on Digital Participation[196]
- ICANN, data resources on domain names and IP addresses
- ITU, regulatory databases and information resources (these may require subscription)
- Open Knowledge International, *Global Open Data Index*[197]
- UNESCO, *Trends in Media Pluralism* (part of the report on *World Trends in Freedom of Expression and Media Development*)[198]
- World Economic Forum, *Global Competitiveness Index* – e.g. innovation and technological readiness sub-section[199]

Theme D • Open Content

Evidence concerning the indicators in this theme can be obtained from:

- legal and regulatory arrangements concerning communications and traffic management
- government departments and legal authorities concerned with content and copyright
- transparency reports and information concerning traffic management arrangements from communications and Internet businesses
- media reports and academic studies
- information from credible and authoritative informants, including Internet businesses

Additional evidence concerning copyright enforcement can be sought from the World Intellectual Property Organisation (WIPO).

Additional evidence concerning open educational resources can be sought from educational authorities, agencies and associations.

The following international agreements are concerned with intellectual property arrangements:

- The WIPO Copyright Treaty, 1996[200]
- The Agreement on Trade-Related Aspects of Intellectual Property Rights, 1993[201]
- The Berne Convention for the Protection of Literary and Artistic Works, 1886[202]
- UNESCO Paris OER Declaration, 2012[203]
- UNESCO, Ljubljana OER Action Plan, 2017[204]

International documents and data sets concerned with open content include:

- Global Innovation Policy Centre, *Global IP Index*[205]
- Global Net Neutrality Coalition, *Status of Net Neutrality around the world*[206]
- INSEAD, WIPO and SC Johnson College of Business, *Global Innovation Index*[207]
- Open Knowledge International, *Global Open Data Index*[208]
- SPARC, *OER State Policy Tracker*[209] and *Open Access Spectrum Evaluation Tool*[210]
- UNESCO and Commonwealth of Learning, *A Basic Guide to Open Educational Resources*[211]

Theme E • Open Data and Open Government

Evidence concerning the indicators in this theme can be obtained from:

- legal and other arrangements concerning open data and open government
- reports from government departments concerning implementation and use of open data and open government
- government websites
- information compiled by UN DESA through its regular *E-Government Survey*[212] and E-*Participation Index*[213]
- opinion surveys of users of open government services
- media reports and academic studies
- information from credible and authoritative informants, including Internet businesses

International indicator frameworks and data sets concerned with open data and open government include:

- Open Government Partnership, Independent Reporting Mechanism[214]
- Open Knowledge International, *Global Open Data Index*[215]
- Open Technology Institute, Ranking Digital Rights *Corporate Accountability Index*[216]
- UN DESA, *E-Government Survey*[217] (particularly Online Service Index) and *E-Participation Index*[218]
- Waseda University, *E-Government Index*[219]
- World Justice Project, *Open Government Index*[220]
- World Wide Web Foundation, *Open Data Barometer*[221]

Category A • Accessibility to All

General

The *2030 Agenda for Sustainable Development* include the target 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.'[222] More detailed targets have been established by the ITU's Connect 2020 Agenda and by the Broadband Commission for Sustainable Development.

Data sets on ICT access and use are gathered from national statistical systems by the ITU and published online in a variety of formats (some of which require subscription).[223] The GSM Association researches and collates data on mobile and mobile Internet.[224] The Economist Intelligence Unit and internet.org publish an Inclusive Internet Index.

Theme A • Policy, Legal and Regulatory Framework

Evidence concerning the indicators in this theme can be obtained from:

- legal and practical arrangements for data gathering on Internet access and use, and reporting arrangements to international agencies
- existence of household and opinion surveys
- legal and regulatory framework for communications access and rights
- data concerning universal access from government departments and communications businesses
- data concerning public access facilities
- media reports and academic studies
- information from credible and authoritative informants, including Internet businesses

National regulatory approaches are catalogued by the ITU in a variety of formats, some of which require subscription.[225] National broadband policies are listed by the Broadband Commission for Sustainable Development,[226] which has published a series of reports on broadband policy development.[227]

Theme B • Connectivity and Usage

Evidence concerning the indicators in this theme can be obtained from:

- government statistical offices and communications departments, including reports on connectivity and usage submitted to the ITU and other international agencies
- government policies and regulatory arrangements concerned with universal access
- communications regulators
- fixed and mobile communications network operators
- Internet service businesses, including social media companies
- domain name registries
- household and other surveys concerned with Internet access and use
- international Internet traffic data
- media reports, academic and business consultancy studies
- information from credible and authoritative informants

International indicator frameworks and data sets concerned with accessibility and use include:

- Alliance for Affordable Internet, Affordability Index[228]
- Budde.comm, various indicators of relevance[229]
- CETIC.br, *ICT Households and Enterprises Index*[230]
- DIRSI, LIRNEasia and Research ICT Africa, *After Access* surveys[231]
- DW Akademie, Model on Digital Participation[232]
- GSMA, *Mobile Connectivity Index*[233]
- Internet Governance Forum, reports on *Connecting and Enabling the Next Billion(s)*[234]
- ITU, *ICT Development Index*[235] and its access and usage sub-indices, analysed in annual *Measuring the Information Society* reports[236]
- OECD connectivity and usage indicators[237]
- Packet Clearing House, *Internet Exchange Directory*[238]
- World Economic Forum, *Networked Readiness Index*[239]
- World Wide Web Foundation, *Women's Rights Online:* Digital Gender Gap Audit and Digital Gender Gap Scorecard[240]

Theme C • Affordability

Evidence concerning the indicators in this theme can be obtained from:

- government statistical offices and communications departments, including reports on connectivity and usage submitted to the ITU and other international agencies
- government policies and regulatory arrangements concerned with universal access
- communications regulators
- fixed and mobile communications network operators
- Internet service businesses, including social media companies
- household and other surveys concerned with Internet access and use
- media reports, academic and business consultancy studies
- information from credible and authoritative informants

International indicator frameworks and data sets concerned with affordability include:

- Alliance for Affordable Internet, *Affordability Index*[241] and *Policy and Regulatory Good Practices*[242]
- DIRSI, LIRNEasia and Research ICT Africa, *After Access* surveys[243]
- DW Akademie, Model on Digital Participation[244]
- Economist Intelligence Unit and Facebook, *Inclusive Internet Index*[245]
- Freedom House, *Freedom on the Net* – e.g. obstacles to access sub-section[246]
- ITU, *Measuring the Information Society* reports[247]
- World Economic Forum, *Networked Readiness Index*[248]
- GSMA, *Mobile Connectivity Index*[249]

Theme D • Equitable Access

Evidence concerning the indicators in this theme can be obtained from:

- government statistical offices and communications departments, including reports on connectivity and usage submitted to the ITU and other international agencies
- government policies and regulatory arrangements concerned with universal access
- communications regulators
- fixed and mobile communications network operators
- Internet service businesses, including social media companies
- household and other surveys concerned with Internet access and use, including perception surveys concerned with barriers to access and use

- international and national agencies concerned with specific groups within the community, including women, children, young people, people with disabilities and ethnic minorities
- media reports, academic and business consultancy studies
- information from credible and authoritative informants

International indicator frameworks and data sets concerned with equitable access include:

- DIRSI, LIRNEasia and Research ICT Africa, *After Access* surveys[250]
- DW Akademie, Model on Digital Participation[251]
- Economist Intelligence Unit and Facebook, *Inclusive Internet Index*[252]
- GSMA, GSMA Intelligence reports[253] (requires registration)
- ITU, data sets in ICT Indicators database (some of which may require subscription)[254]
- UNESCO, *Opening New Avenues for Empowerment: ICTs to Access Information and Knowledge for Persons with Disabilities*, 2013[255]
- World Health Organisation,
- World Wide Web Consortium, *Web Content Accessibility Guidelines*[256]
- World Wide Web Foundation, *Women's Rights Online:* Digital Gender Audit and Digital Gender Scorecard[257]

Theme E • Local Content and Language

Evidence concerning the indicators in this theme can be obtained from:

- government statistical offices and communications departments, including reports on connectivity and usage submitted to the ITU and other international agencies
- government policies and regulatory arrangements concerned with universal access
- communications regulators
- ICANN, Regional Internet Registries and national domain name registries
- fixed and mobile communications network operators
- Internet service businesses, particularly Wikimedia (for E2)[258] and social media businesses (for E3)
- household and other surveys concerned with Internet access and use, including perception surveys concerned with barriers to access and use
- international and national agencies concerned with linguistic and ethnic minorities, including indigenous communities
- media reports, academic and business consultancy studies
- information from credible and authoritative informants

International indicator frameworks and data sets concerned with local content and language include:

- DIRSI, LIRNEasia and Research ICT Africa, *After Access* surveys[259]
- DW Akademie, Model on Digital Participation[260]
- Partnership on Measuring ICT for Development, *Final WSIS Targets Review*, chapter concerning target 9 (assesses indicators on content and language, including those concerned with domains and Wikipedia content)[261]
- Statistica, data on ccTLDs[262]
- GSMA, *Mobile Connectivity Index*[263]
- OECD, *Measuring Digital Local Content*[264]
- Packet Clearing House, *Internet Exchange Directory*[265]
- UNESCO, *Twelve years of measuring linguistic diversity in the Internet: balance and perspectives*[266]
- UNESCO, G*lobal Report: Re/shaping Cultural Policy*[1]
- World Bank data on secure webservers[267]

Theme F • Capabilities / Competencies

Evidence concerning the indicators in this theme can be obtained from:

- government statistical offices and communications departments, including reports on connectivity and usage submitted to the ITU and other international agencies
- government departments
- educational authorities, higher education institutions and civil society organisations concerned with education
- household and other surveys concerned with Internet access and use, including perception surveys concerned with barriers to access and use
- workplace surveys and labour market data
- media reports and academic studies
- information from credible and authoritative informants

International data relevant to ICT skills are gathered by the UNESCO Institute for Statistics and in the ITU ICT Indicators Database. Relevant data can also be found in the Human Capital Index of the UNDESA E-Government Survey. See also ITU, *Digital Skills Toolkit,* 2018.[268]

Evidence concerning media and information literacy (F2) may be obtained from a variety of sources including UNESCO, *Global Media and Information Literacy Assessment Framework*[269] and UNESCO, *Media and Information Literacy Policy and Guidelines*, 2013.[270]

Issues concerning the definition of STEM subjects and occupations have been addressed by UNESCO's International Centre for Technical and Vocational Education and Training.[271]

1 http://en.unesco.org/creativity/global-report-2018

Category M • Multistakeholder Participation

General

The *Tunis Agenda for the Information Society*,[272] which concluded the World Summit on the Information Society (WSIS) in 2005, endorsed 'the development of multi-stakeholder processes at the national, regional and international levels' concerning the Internet 'as a means to achieve internationally agreed development goals and objectives…' The UN General Assembly reaffirmed its commitment to multi-stakeholder processes in the Outcome Document from its 2015 review of implementation of WSIS outcomes.[273]

Indicator frameworks for the assessment of participation in governance have been developed by a number of organisations, including:

- UN, *E-Participation Index*[274]
- World Justice Project, *Open Government Index* – e.g. publicised laws and right of access to information sub-sections[275]

The following reports from UNESCO are concerned with multistakeholder participation and multistakeholder principles on the Internet:

- *Principles for governing the Internet: a comparative analysis*, 2013[276]
- *What if we all governed the Internet? The evolution of multistakeholder participation in Internet governance*, 2017[277]

Other documents and reports concerning multistakeholder Internet governance include

- APC, *GISwatch 2017 – National and Regional Internet Governance Forum Initiatives*[278]
- Global Commission on Internet Governance, *One Internet*[279]
- Global Partners Digital, *Framework for Multistakeholder Cyber Policy Development*[280]
- IGF, National and Regional IGFs registry[281]
- NETmundial Initiative, *NETmundial Internet Principles*[282]
- World Justice Project, *Open Government Index*[283]

Theme A • Legal and Regulatory Framework

Evidence concerning the indicators in this theme can be obtained from:

- government official publications and reports
- legal frameworks for e-commerce, digital signatures, cybersecurity, data protection and consumer protection
- data compiled and published in DESA's biennial E-Government Survey and e-participation index
- media reports and academic studies
- information from credible and authoritative informants

Theme B • National Internet Governance

Evidence concerning the indicators in this theme can be obtained from:

- government official publications and reports
- arrangements representation and participation in Internet and Internet-related decision-making
- information from Internet associations, including Internet Society chapter
- national IGF, including annual reports to global IGF
- national domain name registry
- media reports and academic studies
- information from credible and authoritative informants

Theme C • International Internet Governance

Evidence concerning the indicators in this theme can be obtained from:

- government official publications and reports
- arrangements for representation and participation in Internet and Internet-related decision-making
- information from Internet associations, including Internet Society chapter
- national IGF, including annual reports to global IGF
- global and regional IGFs
- ICANN and ITU
- media reports and academic studies
- information from credible and authoritative informants

Category X • Cross-Cutting Indicators

Theme A • Gender

Articles 3 of the ICCPR and the ICESCR assert the equal rights of men and women.[284] The rights of women are elaborated in the Convention on the Elimination of all forms of Discrimination against Women (CEDAW).[285]

Goal 5 of the UN Sustainable Development Goals is concerned with gender equity.[286] The following other international documents and reports are concerned with gender equality and empowerment:

- UNDP, Beijing Declaration and Platform for Action
- UNDP, Gender Development Index

Evidence concerning the indicators in this theme can be obtained from:

- government official publications and reports
- statistics on connectivity and access compiled by national statistical offices

- statistics from communications businesses, including network operators and online services
- household and other surveys, including perception surveys and focus groups of women users and non-users
- legal reports concerning online gender-based harassment and violence
- media and civil society reports and academic studies
- evidence concerning skills and skills development from educational authorities, higher educational institutions
- workplace surveys and other evidence concerned with skills and capabilities
- information from credible and authoritative informants

Attention should be paid when using these indicators to intersectionality, *i.e.* the relationship between gender and other social and economic factors which can be identified through disaggregation.

Many areas of content are relevant to gender equality and empowerment. Information about reproductive and sexual health has been chosen as a representative theme for this indicator (A6). Evidence concerning relevant content may be obtained from ministries of health and civil society organisations

International indicator frameworks and data sets concerned with gender and the Internet include:

- Association for Progressive Communications, *Gender Evaluation* Methodology[287]
- Broadband Commission for Digital Development, *Doubling Digital Opportunities: Enhancing the Inclusion of Women and Girls in the Information Society*[288]
- Broadband Commission for Digital Development, *Recommendations for Action: bridging the digital gender gap in Internet and broadband access and use*[289]
- GSMA, *Mobile Gender Gap Report*[290]
- IGF Best Practice Forum on Gender, *Overcoming Barriers to Enable Women's Meaningful Internet Access*[291]
- ITU, *Women in ITU Meetings*[292]
- UNCTAD and ILO, *Empowering Women Entrepreneurs through ICT*[293]
- UNESCO, *Cracking the Code: Girls' and Women's Education in Science, Technology, Engineering and Mathematics*[294]
- UNESCO, *Gender-Sensitive Indicators for Media*[295]
- UNESCO, *Mobile Phones and Literacy: Empowerment in Women's Hands*[296]
- UNCTAD, *Measuring ICT and Gender*[297]
- World Economic Forum, *Global Gender Gap Report*, 2017[298]
- World Wide Web Foundation, *Women's Rights Online:* Digital Gender Audit and Digital Gender Scorecard[299]

Theme B • Children

This theme is concerned with children. In addition to the rights for all people established by the UDHR, ICCPR, ICESCR, CEDAW and ICERD, the rights of children are established by the Convention on the Rights of the Child.[300]

Evidence for indicators concerned with children can be obtained from:

- government official publications and reports
- statistics on connectivity and access compiled by national statistical offices
- statistics from communications businesses, including network operators and online services
- media and civil society reports and academic studies
- information from credible and authoritative informants
- household and other surveys that include children as a defined group, including perceptions of attractions of and barriers to use of the Internet
- international and national children's agencies including UNICEF
- educational authorities and institutions

An indicator framework for comparative assessment of children's relationship with the Internet, *Children's Rights in the Digital Age*,[301] has been developed by Global Kids Online.

The following reports from UNESCO and other UN agencies are also concerned with children's rights and appropriate policies for children.

- Council of Europe, *Child Participation Assessment Tool*[302]
- UNESCO, *Survey on Privacy in Media and Information Literacy with Youth Perspectives*[303]
- UNICEF, *The State of the World's Children 2017 – Children in a Digital World*, 2017[304]
- UNICEF, *Child Online Safety Assessment Tool*[305]
- UN Special Rapporteur on Freedom of Opinion and Expression, *Report on the right of the child to freedom of expression,* 2014[306]

Theme C • Sustainable Development

The internationally-agreed framework for sustainable development is set out the United Nations' *2030 Agenda for Sustainable Development*. This includes 17 Sustainable Development Goals, each of which includes a number of targets for achievement, usually by 2020 or 2030.

An indicator framework for assessing progress towards achievement of the SDGs has been developed by the UN Department for Economic and Social Affairs in cooperation with other UN agencies. This contains a small number of Internet-related indicators, and will be updated during the course of SDG implementation.

Evidence concerning the indicators in this theme can be obtained from:

- official publications and reports from government departments concerned with sustainable development
- national statistical offices
- statistics on e-waste
- statistics from communications businesses, including network operators and online services

- household and other surveys concerned with the use of online banking, mobile financial services, online learning services, online health services and online shopping services
- educational authorities
- statistics concerning e-commerce and surveys of SMEs
- media and civil society reports and academic studies
- information from credible and authoritative informants

The following international documents and data sets are concerned with the Internet and sustainable development:

- Broadband Commission for Sustainable Development, various publications[307]
- DIRSI, LIRNEasia and Research ICT Africa, *After Access* surveys[308]
- GSMA, *State of the Industry Report on Mobile Money*[309]
- Internet Society, *The Internet and Sustainable Development*[310]
- ITU and UNU, *Global E-Waste Monitor*[311]
- UN DESA, E-*Government Surveys*[312]
- UN DESA, *Advancing a Sustainable Information Society for All*, 2015[313]
- UN Stats, SDGs[314]
- World Bank, *World Development Report 2016, Digital Dividends*[315]

Theme D • Trust and Security

Evidence concerning the indicators in this theme can be obtained from:

- official publications and reports from government departments concerned with sustainable development
- national statistical offices
- reports from national CERT and other cybersecurity authorities
- reports from consumer and data protection authorities
- evidence from communications businesses, including network operators and online services
- evidence from ISPs and antivirus businesses
- household and other surveys, including perceptions of cybersecurity
- media and civil society reports and academic studies
- information from credible and authoritative informants

The following international documents and data sets are concerned with trust and security:

- Akamai, *State of the Internet* index[316]
- Breach Level Index, *Data Breach Statistics*[317]
- Carnegie Cyber Policy Initiative, *Cyber Norms Index*[318]
- Europol, *Internet Organised Crime Threat Assessment*[319]
- Global Cybersecurity Capacity Centre, *Cybersecurity Capacity Maturity Model for Nations*[320]
- ITU, *Global Cybersecurity Index*[321]
- OECD, *Guidelines in Measuring Trust*[322]
- UNCTAD, *Global Cyberlaw Tracker*[323]
- UN Office on Drugs and Crime (UNODC), *Cybercrime Repository*[324]
- World Bank, *Combating Cybercrime Index*[325]
- World Bank, data on secure Internet servers per million population[326]

Theme E • Legal and Ethical Aspects of the Internet

Evidence concerning the indicators in this theme can be obtained from:

- official publications and reports from government departments concerned with sustainable development
- industry self-regulatory bodies
- police and cybersecurity/cybercrime authorities and consumer protection agencies
- evidence from communications businesses, including network operators and online services
- household and other surveys, including perceptions of cybersecurity
- media and civil society reports and academic studies
- information from credible and authoritative informants

The following international documents and data sets are concerned with legal and ethical aspects of the Internet:

- APC, *From Impunity to Justice*[327]
- GSMA, *A framework to understand women's mobile-related safety concerns in low-and middle-income countries*[328]
- IGF BPF, *Online Abuse and Gender-Based Violence Against Women*[329]
- International Association of Prosecutors, *Global Prosecutors e-Crime Network* – training and database of best practices[330]
- Open Technology Institute, Ranking Digital Rights *Corporate Accountability Index*[331]
- Take Back The Tech!, *Mapping Technology-Related Violence Against Women*[332]

- UNCTAD, *E-Commerce Index*[333]
- UNCTAD, *Global Cyberlaw Tracker*[334]
- UNESCO, *Countering Online Hate Speech*[335]
- UN High Commissioner for Human Rights, Annual Report 2013[336]
- UNODC, *Cybercrime Repository*[337]
- UNODC, *Cybercrime Repository* (database) – e.g. database of cybercrime legislation, lessons learned, case law database[338]
- World Bank, *Combating Cybercrime Index*[339]
- World Wide Web Foundation, *Women's Rights Online:* Digital Gender Audit and Digital Gender Scorecard[340]

10

Implementing UNESCO's Internet Universality Indicators

African migrants on the shore of Djibouti City at night raise their phones in an attempt to catch an inexpensive signal from neighboring Somalia—a tenuous link to relatives abroad. Djibouti is a common stop-off point for migrants in transit from such countries as Somalia, Ethiopia and Eritrea, seeking a better life in Europe and the Middle East. John Stanmeyer's "Signal" won the 2013 World Press Photo of the Year award.

Cover photo: John Stanmeyer/National Geographic Creative

A practical guide to conducting national assessments

1. Introduction

2.Implementing the indicators

Action step 1: Establishing a Multistakeholder Advisory Board
Action step 2: Building a research team
Action step 3: Developing a project action plan
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Action step 5: Data analysis
Action step 6: Report-writing and recommendations
Action step 7: Organizing of national validation multistakeholder workshop and conducting related advocacy activities
Action step 8: Impact assessment and monitoring

3. Looking to the future

4. Engagement with UNESCO

1. Introduction

UNESCO's framework of Internet Universality Indicators (IUIs) was developed through a global, open, inclusive and multistakeholder process between 2017-2018. This work was presented to UNESCO's International Programme for the Development of Communication (IPDC) in November 2018. The governing council of the IPDC then took a decision to welcome the Indicators Framework and to endorse the voluntary application of the instrument for stakeholders to conduct national assessments of Internet development.1

The framework is a unique and powerful resource which has been developed through an extensive process of research, consultation and analysis, to help governments policy and regulation authorities as well as other stakeholders to:

- develop a clear and substantive understanding of their national Internet environment and policies;
- assess that environment and policies in relation to the implementation of UNESCO's Rights, Openness, Accessibility to all, and Multistakeholder (ROAM) principles; and
- formulate policy recommendations and practical initiatives that will enable them to meet their goals and align with the UNESCO principles as the Internet evolves.

This chapter comprises an Implementation Guide that is intended to help researchers implement the IUIs in diverse national contexts.

The Implementation Guide

This Implementation Guide draws upon discussions held during the IUIs framework consultation process and the experience of researchers and stakeholders who undertook the pre-tests and pilots of the IUIs. It considers the organisation and management of research projects and addresses some of the challenges that are likely to arise while undertaking them. It will be revised in response to further experience in implementing the indicators and new developments in Internet.

Core indicators and partial assessments

The IUIs provide a comprehensive framework for assessing national Internet environments. UNESCO hopes that this framework will be used as a whole, in order to develop as full information base as possible concerning the national Internet environment from the evidence that is available.

UNESCO recognises, however, that implementation of the comprehensive framework will require significant resources in research time and expertise, which may not be available in all cases. A shorter and more concentrated set of core indicators has therefore been selected, from among those in the comprehensive framework, for use where insufficient resources are available to undertake a full assessment. These include at least a number of indicators taken from every ROAM-X Category within the comprehensive framework.2

UNESCO also recognises that some governments and other stakeholders may wish to undertake partial assessments built around ROAM-X Categories that are of particular concern to them. This 'toolbox' approach is possible, as many of the ROAM-X Indicators in the framework allow researchers to pay additional attention to issues which are of special interest to them. Individual Categories could be used, for example, to explore

1 Decisions taken by the 31st Council Session of the International Programme for the Development of Communication (IPDC), 21-22 November 2018, UNESCO HQ. https://unesdoc.unesco.org/ark:/48223/pf0000266235

2 An earlier version of the core indicators was successfully piloted in Brazil, Senegal and Thailand in 2018, and that experience fed into the finalised version.

particular dimensions of the national Internet experience. UNESCO believes that such uses could be helpful where appropriate, although 'cherry-picking' of scattered indicators which will bias the overall impression created by the findings is to be avoided.

A further use of these ROAM-X Indicators is pedagogical. Lecturers are invited to use this international instrument to educate learners about the complexities of Internet governance issues and the need for knowledge about the range of dimensions covered in these indicators.

2. Implementing the indicators

The IUIs framework is a multifaceted research tool designed to achieve substantive and wide-ranging findings that will have real value to policy-makers, regulatory bodies, and other stakeholders, thereby improving the quality of policy-making and practice. An application of the indicators in a given country requires a budget to be elaborated and funds be raised. UNESCO can assist in this process, although will not be able to meet the full cost in many cases. Therefore, mobilisation of resources from government, private sector, foundations and in-kind contributions (e.g. by research institutions) is part of the process. Those actors contributing resources should be clear, however, that the integrity of the research process requires its independence of donors.

Implementation of the framework will require careful planning, sufficient time and resources for effective data gathering and analysis, and inclusive discussion of findings and recommendations. This can be divided into eight main action steps:

- Action step 1: Establishing a Multistakeholder Advisory Board
- Action step 2: Building a collaborative research team
- Action step 3: Developing a research action plan
- Action step 4: Data gathering
- Action step 5: Data analysis
- Action step 6: Report-writing and recommendations
- Action step 7: Organizing of national validation multistakeholder workshop and conducting related advocacy activities
- Action step 8: Impact assessment and monitoring

These are discussed in the following sections of this guide.

Action step 1: Establishing a Multistakeholder Advisory Board

Creating such a board is not a prescribed condition conducting a national assessment using these indicators. However, it is strongly recommended where political conditions do allow an independent research exercise to be conducted.

UNESCO's success in developing the indicators benefited significantly from the support of a Multistakeholder Advisory Board (MAB) composed of a wider group of independent experts from different areas of expertise and interest. UNESCO believes that the same can apply to doing a national assessment with the indicators where conditions make this possible. Hence, it is recommended in general that a broad-based Multistakeholder Advisory Board be established before conducting the research action steps, and be regularly engaged so as to support the national assessment process and trigger policy discussions on the findings. UNESCO National Commissions or any other stakeholder could play a role in setting up a MAB.

It is also recommended to involve Policy and Regulation authorities in ICT or digital economy as well as National Statistical offices and the major Internet stakeholders in an inclusive and transparent manner.

1.1 Objectives of the Board

The role of the Board is to reinforce the quality, legitimacy and transparency of national assessment processes. It will also help to ensure the assessments are sufficiently resourced through contributions in cash and kind so and can be carried out to a high standard, ensuring an effective impact.

1.2 Composition

Each member should be an expert who has expertise and experience in some areas of the research in relation to applying the Internet Universality indicators.

The Multistakeholder Advisory Board should preferably be composed of leading experts from various stakeholders including governments (regulatory and policymaking bodies), academic, technical community, private sector, journalists and media organizations, civil society, individual Internet users, UN agencies and intergovernmental groups. The pre-tests and pilots undertaken for the IUIs have demonstrated the particular value of government engagement in enabling access to official data sources.

The Multistakeholder Advisory Board should also ideally extend beyond the traditional stakeholder groups (government, business, civil society, the Internet technical community) to reflect diversity within those groups (e.g. business users of the Internet, as well as businesses supplying Internet services). The Multistakeholder Advisory Board should have geographical and gender balance, engage youth and particularly include experts in gender and children/youth issues.

Between 8 and 18 members is likely to be manageable.

Members should support the project in their expert capacity, not as representatives of any entity. What is important is that they should be credible persons and capable of adding value as well as bring perspectives from the communities they come from. Their role is advisory, and not editorial.

The Multistakeholder Advisory Board members are not paid, but tend to be given credit in the final report (should they so wish).

1.3 Terms of Reference

MAB members are expected to suggest resources for the assessment as well as data sources to the researchers and help to open doors to these.

Each MAB member should be able to commit a few hours every two months to respond to relevant emails and work on the Multistakeholder Advisory Board.

Each MAB member should seek to attend physical and/or online consultation meetings and events whenever possible and without budgetary burden.

Each MAB member should take responsibility to help peer review the final report for publishing purpose. This role is not to override research findings or influence them in pursuit of vested interests, but to consider issues of scientific quality and linkage between findings and recommendations, as well as how the work can be strengthened.

Each MAB member should be proactive in participating in a national validation workshop at the end of the research, and in engaging with policy makers in government, business and other institutional settings to effect change in line with the recommendations arising from the findings of the assessment.

1.4 UNESCO support

UNESCO, via its National Commissions and/or its field offices, can provide overall support and technical assistance in establishing the Multistakeholder Advisory Board and avail representatives to serve as a member or observer.

UNESCO can also provide support through its intergovernmental programmes, including the Information for All Programme (IFAP). Through its network of national committees, IFAP can join synergies with national stakeholders to facilitate the implementation of the ROAM-X indicators at the national level..

Action step 2: Building a research team

Generally, the research will be conducted by a team of researchers. The team should be substantial enough to work effectively, but small enough to facilitate effective group work. An assessment of all the indicators (not restricted the core ones) may involve between 5 and 8 researchers at various levels of expertise and experience.

One of these persons needs to be team leader with overall responsibility for the successful execution of the research. The team leader has a responsibility to contribute to establishing and engaging with the Multistakeholder Advisory Board for advice as the liaison person.

2.1 Composition of the research team

The IUIs framework has been designed to be used by a group of researchers that brings together a range of expertise in different aspects of the Internet environment. UNESCO believes that most value will arise where teams include researchers, while having research experience as a necessary consideration, are also drawn from diverse stakeholder groups concerned with Internet development, access and rights. A broad composition of the research team helps ensure that a full range of perspectives is considered during research and in strengthening the credibility of findings including amongst those who will be affected by subsequent recommendations. The composition of research teams along these lines will help to ensure that recommendations are more inclusive and representative, and that they focus on the interests of the country as a whole rather than privileging the views of its Internet community.

The following aspects of diversity could usefully be considered when assembling such a team:

- Implementation teams should reflect the demographic diversity of the country concerned, including gender, different age groups, ethnicity and regionality.
- They should include diversity of expertise, including at least one member with expertise in each of the different ROAM-X Indicators Categories.

- Teams should include both Internet insiders and those whose expertise does not lie with the Internet but who are primarily concerned with its impact on economy, society and culture.

Teams should include different perspectives on the Internet and its role within society. Research teams should not be made up only of those who hold a particular view of the Internet but should rather provide a space for dialogue between different perspectives and ideas about its future.

In addition to ensuring diversity within the research team, special efforts should also be made in the data-collection and analysis to reflect not just the perspectives and experiences of Internet experts, but also of different communities of Internet users and non-users. This means a team's assessment should be sensitive to perspectives of women, children, people in different age groups, migrants and refugees, people with disabilities, sexual minorities and people from different language groups.

Action step 3: Developing a project action plan

Once a research team has been established, it will be important to:

a) build a common understanding within this team of the objectives of the research project;

b) elaborate, within the available budget, a work plan; and

c) mutually agree upon how the group will work together as the project proceeds.

3.1 Establishing objectives

As previously noted, the IUIs have been developed to help governments and other stakeholders:

- develop a clear and substantive understanding of their national Internet environment;
- assess this environment in relation to the implementation of UNESCO's ROAM principles; and
- formulate policy approaches and practical initiatives that will enable them to meet their goals in line with the UNESCO principles and international standards as the Internet continues to evolve.

While these broad goals are likely to apply in all applications of the IUIs framework, the implementation of the indicators in individual countries will also need to respond to particular challenges or opportunities in those countries, and feed into other policy processes and national priorities. There may be some indicators of greater significance than others to a given country, and which merit more in-depth research than others. It will therefore be important to clarify and agree specific goals for the project from the outset. This should be done in terms of elaborating or adapting the three points above, and by considering any specific issues that need to be addressed within the national context.

A clear written statement of project goals and priorities for special attention will help to facilitate cooperation amongst researchers. Experience in the pre-tests and pilots shows that such a statement can also prove invaluable in demonstrating the legitimacy and credibility necessary for facilitating access to sources – including data held by government and business.

3.2 Designing a work plan

After developing the statement of objectives, the next priority for the research team should be to design a work plan that will enable it to maximise data gathering in a way that allows sufficient time for analysis and the development of recommendations within the timeframe and resources available.

The detailed design of a work plan will depend on the circumstances of each individual project, including the goals that were agreed upon, participating organisations, the expected availability of evidence, and other aspects of the national context. Researching a large country with multiple population centres poses different challenges to researching a small island state. A study will normally take a minimum of six to eight months from start to finish.

The work plan should pay particular attention to:

- the interpretation of indicators where needed, the means of verification for each indicator, as well as data sources;
- the distribution of work between different members of the research team;
- a timetable for preparation, research, analysis and report-writing; and
- methods of coordination and collaboration between team members.

A report arising from an application of the IUIs may be published independently of UNESCO, given that the Indicators Framework is open access under a Creative Commons licence. However, where UNESCO is the publisher, the Organization reserves the right to quality assurance of the text to be published. In this case, time should be built in so as to provide for the Organisation's review processes. Contact UNESCO for further information in this regard.

The work plan should provide a realistic and robust framework for implementing the IUIs, but some flexibility will be needed, for example to deal with unexpected difficulties in obtaining evidence in certain areas. It should be reviewed at key points in the timetable to determine whether adjustments should be made.

Research teams may find it helpful to make use of project management software in order to keep track of research and analysis during implementation.

3.3 Coordination of the research team

Experience with UNESCO's Media Development Indicators has shown the importance of ensuring effective cohesion and coordination within the research team.

While individual team members may take lead responsibility for different Categories or areas of work (for example, for particular Categories), they should ideally not undertake research and assessment of findings in isolation. UNESCO recommends that several team members should conduct research in communication with colleagues and participate in collective assessment of each Category. This is particularly important in ensuring that diversity of experience and perspective is brought to bear on potentially controversial or contentious issues while research is being undertaken, rather than being left for resolution at later stages of the project.

It would be helpful in this context to establish from the outset:

- the lead responsibility for particular areas of work between different members of the research team;
- supporting roles to be played in these areas by other team members;
- arrangements for regular discussion within the team, either online or face-to-face; and
- arrangements for drafting and discussing project findings and recommendations.

Action step 4: Data gathering and sources

The third and central phase of work within a project to apply the ROAM-X Indicators Framework in a country consists of data gathering. This phase will vary substantially between countries because of differences in the quantity and quality of evidence that is available.

This section of the guide is concerned with the overall framework for data gathering, the sources that are likely to be available, and some of the challenges that are likely to arise in obtaining and making use of evidence. Issues concerned with the analysis of evidence will be discussed in section 6 below.

4.1 The framework for data gathering

The broad framework for data gathering should be included in the project's work plan (see above). It should begin with discussion about how the indicators are to be interpreted in the context of the country.

- While most indicators will be straight-forward and clear, some will require adaptation and interpretation that should be made explicit both for the research process as well as in the final report.
- Discussion should ensure that the team is clear about the means of verification for the indicator concerned.
- It is necessary to undertake a comprehensive review to identify the sources that are available within the country, in addition to the sources identified in the relevant chapter of the ROAM-X Indicators Framework itself.

UNESCO recommends that this review should include:

- a literature review to identify official and non-official sources of quantitative data, academic and other research reports, credible and authoritative qualitative sources, and agencies and organisations from which unpublished information can be sought;
- email or telephone interactions with official agencies, businesses and other organisations concerning access to unpublished evidence they may hold; and
- discussions with key informants (including Multistakeholder Advisory Group members) to identify additional sources of evidence and establish relationships which will include subsequent informant interviews.

Group discussions and sampled questionnaire survey can be considered, for example, for collecting information related to users and individuals' experience including those related to gender and youth issues.

This clarification of sources will enable the research team to:

- establish a realistic timetable for data gathering (including desk research, informant interviews and other sources);
- finalise the allocation of research time and resources (including the distribution of research team roles); and
- clarify aspects of the framework which either cannot be effectively included or would require primary research which may not be possible to do within the assessment process.

While an initial 'literature-plus' review along these lines should identify the large majority of potential sources, others are likely to become apparent during the course of subsequent research and should be incorporated as and where appropriate as the project proceeds.

4.2 Sources

Three main types of sources are included in the Indicators Framework: institutional indicators, quantitative indicators, and qualitative indicators. These are elaborated later in this section.

Researchers will find a wide variety of sources of evidence and means of verification available to them. Some of these will be useful across a range of indicators, while others will be specific to particular indicator categories.

Together, it is desired that indicators of these three kinds will enable researchers to form a collage of evidence that reinforces synergies amongst the Categories that make up the IUI framework.

An overall guide to sources and means of verification is included in the relevant chapter in the Indicators Framework. This suggests potential sources for each category and for each theme within each Category. Those concerned with themes are usually divided into two main groups.

- The first group identifies generic sources which are likely to be available and useful when considering the theme concerned (for example, 'official publications and reports', reports of national committees and councils including 'reports by national human rights committees and councils', 'opinion surveys of users of government services', 'domain name registries', 'ICT observatories reports,'etc.). There will be some

variation in these between countries, and there are likely to be some sources that are specific to individual countries that should be identified during the 'literature-plus' review described above.

- The second group identifies published sources, including international treaty instruments and standards, international indices compiled by United Nations agencies, the World Bank and other intergovernmental bodies, and assessments by international non-governmental agencies, which may include evidence on the country concerned as well as other countries.

Arrangements for gaining access to official data and other evidence will vary between countries. In some, access to official data has been made much easier because of open data policies. However, the pre-tests and pilot studies indicated that access to data can be much more difficult in countries that have not yet adopted these (or implemented them). Government participation in research projects using the IUIs should help to alleviate this problem, especially if government participants can make formal requests for access on behalf of the research team.

4.3 Consultation, informant interviews and group discussions

The ROAM-X Indicator Framework has been designed to make use of existing available sources of evidence, particularly written sources. Research teams are not expected to undertake primary research, although they may wish or choose to do so, particularly if certain data points are missing from existing research and resources are available (see below).

Research teams will need to supplement desk research through dialogue with relevant stakeholders who have official responsibilities or expertise in particular indicators Categories.

- Experience with UNESCO's Media Development Indicators has shown the importance of informant interviews in building a clearer and stronger evidence base, including the identification of additional published and unpublished sources and understanding of the expert viewpoints held by such informants (some of whom will have been consulted during the design of the project work plan).
- Group discussions involving key informants have also proved useful in other research projects of this kind. Bringing together a number of key informants enables researchers to explore different perspectives on an issue. Such discussion groups differ from focus groups because they are made up of experts chosen for their engagement with and different views on the issues under discussion, rather than made up of participants selected in order to represent particular social or economic groups.

Experience with other indicator frameworks and the development of this indicator framework has also shown that it may be valuable for research teams to invite contributions from interested parties through an open and transparent consultation process. If used, this should not drive the project but be supplementary to desk and other research using existing sources. Evidence derived from consultation responses should be interpreted with care to ensure that findings are not unduly influenced by vested interests. It may be appropriate to publish consultation responses online in order to promote transparency and to prevent the opportunity for, or perception of, undue influence.

Evidence gathered through consultation should distinguish factual from interpretative material, and be cautious about treating either in isolation from additional substantiation. Just because one expert, or even several, said something does not necessarily make it accurate or generalizable. In all cases, such evidence should be attributed to the observer concerned when writing the final report (see also section 5.1 below on Assessing Evidence in General).

4.4 Dealing with data gaps

Significant gaps in the available evidence base will exist in all countries. Experience with other indicator sets indicates, and the pre-tests and pilots verified, that this is likely to be particularly true of Least Developed Countries (LDCs), small islands, and other countries where limited administrative and data gathering resources are available to national statistical services. In some countries, it will be possible to gather evidence for only a minority of indicators in the framework.

This is to be expected, and the framework has been designed to address the challenges posed by such data deficiencies. The aim of the framework is to bring together as much evidence as is available for any country to improve understanding and the quality of policy development. UNESCO believes that this is not less but more important in countries where the available evidence base is limited. This is one reason for the large number of indicators included in the framework, which should help to maximise the range of evidence that can be identified in any country and so contribute, even where data are limited, to improved understanding and policy development. Appropriate sources of evidence for individual Categories are suggested in the Sources chapter and should be supplemented by members of the research team during the initial phase of project planning. It may be necessary for researchers to combine a number of different sources to obtain as full a picture as possible. As far as possible, researchers should prioritise using the most representative and recent data.

Some available sources may be proprietary (paid-for or subscription basis) or gathered by private sector businesses for commercial purposes. Data owners may, if approached, be prepared to make some data from these sources available on a pro bono basis to support an IUIs assessment. Relevant data may also be available from unexpected or unfamiliar sources, such as the data that some online service providers make publicly available through marketing themselves as advertising platforms.

Issues concerned with the nature and availability of data and ways in which this might be addressed are discussed below for each of the three main types of indicators.

4.5 Institutional evidence

Some of the indicators in the framework are concerned with the existence of particular constitutional or legal arrangements and the performance of government agencies and other 'competent' (i.e. responsible) authorities in implementing or enforcing them.

Evidence concerning the existence of constitutional and legal arrangements should be relatively easy to obtain from official publications and informants. Evidence concerning the performance of government agencies and other competent authorities including ICT policy and regulation bodies will require analysis derived from a variety of sources. These sources will vary between countries, but are likely to include government reports and legal instruments, media reports and analyses by academic and civil society sources.

In some cases, Questions and Indicators refer to specific international instruments which have been accepted or ratified by governments. This is particularly the case in Category R, where a number of Indicators refer to international rights agreements such as the International Covenants on Civil and Political and on Economic, Social and Cultural Rights (ICCPR and ICESCR), the Convention on the Rights of the Child (CRC) and the Convention on the Elimination of all Forms of Discrimination Against Women (CEDAW). These instruments, and regional rights agreements which complement and supplement them, set international standards for laws and practices concerning human rights. Additional guidance concerning their implementation and enforcement is available in documents agreed by the UN Human Rights Council. These are referenced in the Sources chapter.

A significant number of other intergovernmental agreements, including UNESCO agreements in areas such as multilingualism and cultural heritage, are relevant to particular Questions and Indicators, and are also referenced in the Sources chapter. In some other cases, international norms and standards have been developed less formally, or with fewer legal obligations, whether by agreement between governments or between other stakeholders. Agreements which have been reached through multistakeholder arrangements and/or by the Internet professional or business communities are also relevant, particularly in Category O (Openness). These types of instruments are also referenced in the Sources chapter.

A large number of international fora now exist for the discussion of Internet governance issues, and it is not possible for a research project with limited resources to explore them all. For this reason, Indicators sometimes select specific exemplar international agreements or arrangements for assessment. Some of the Indicators in Category M (Multistakeholder), for example, focus on multistakeholder participation in three international institutional arrangements – the global, regional and national Internet Governance Fora (IGFs), the International

Telecommunication Union (ITU) and the Internet Corporation for Assigned Names and Numbers (ICANN). These were selected because they have the largest number of participating countries, and so are likely to have relevance in almost every case. Researchers can and should, however, also take participation in other relevant international fora into consideration if they wish.

The terminology and interpretation of terminology in some of these (and other) Questions and Indicators varies from country to country. Where there is no agreed international definition or standard, UNESCO believes that it would unduly restrict research teams to propose within the implementation of this framework a particular definition on them. The Indicators are essentially a tool for national-level research. It is therefore more appropriate for research teams to interpret terminology as it is understood within the national context but then make explicit the meaning they give, as well as reflect on any alternative interpretations which may be current elsewhere and could also have local resonance.

4.6 Quantitative evidence

Some of the indicators in the framework rely on quantitative data, which may be derived from a variety of sources. These may include:

- international data sets, such as those developed by United Nations agencies, which rely on reporting by national statistical offices and other primary sources;
- government data sets, derived through a variety of methodologies;
- business data, which are gathered for commercial purposes, and which may be more up-to-date than data gathered by governments or intergovernmental agencies. (While some businesses may regard such data as commercially confidential, others make relevant data available for public queries, for example through their advertising platforms);
- household surveys undertaken by government agencies, independent research centres, academics or others, which use a sample of the total population; as well as
- other sources of quantitative information.

It should be noted that quantitative data are derived from particular conceptualisations, scoping and research methods, and should be assessed against this background (see 5.4 below). Official data for many quantitative indicators in the framework are likely to be available in countries that have long-established national statistical services, but this is much less likely to be so in many other countries that lack resources for such services. In such contexts, it will be particularly important to identify other potential sources of quantitative information such as those in business data, academic studies and household surveys.

The volume of data which businesses gather and hold for their own commercial purposes comfortably exceeds that available to most governments, particularly on issues such as access. While businesses are generally reluctant to divulge such data, they may be prepared to make some available, particularly if this aims to illuminate understanding of the Internet and support appropriate policy development. Research teams should therefore pursue this avenue, ideally starting in the initial phase of project planning and design.

Disaggregation

Some of the quantitative indicators in the framework request assessment of disaggregated as well as aggregate data. Disaggregation refers to the breakdown of aggregate data for an indicator into separate figures for different population groups within the total population sample. This is particularly important when considering access to and impact of the Internet on different social groups, for example, women and men, particular age groups (such as children and the elderly), regions (for example urban and rural areas, or for different provinces in federally-governed countries), ethnic or language communities, and people with disabilities.

Attention should also be focused, where possible, to intersectionality, i.e. to the relationship between multiple disaggregated factors (e.g. gender plus ethnicity plus income) in influencing outcomes for individuals and consequential policy requirements.

Unfortunately, as the pre-tests and pilots for the IUIs have shown, few data sets which are currently available will be susceptible to disaggregation in many countries. Researchers should nevertheless seek out what is available. Household and similar sample surveys, where they are undertaken, often have greater granularity in this respect than official statistics. Businesses may also be willing to divulge more disaggregated data to researchers than they would usually expect to publish. UNESCO hopes that greater demand for disaggregated data will encourage governments and national statistical offices to pay them more attention in the future.

4.7 Qualitative evidence

Some of the indicators in the framework are concerned with qualitative evidence, i.e. with the non-statistical assessment of what is happening within national Internet environments. Qualitative evidence is no less valuable or insightful than quantitative evidence: the two types of evidence complement one another, and both are critical to effective analysis of Internet universality.

Qualitative evidence is particularly important in the IUI framework because:

- many of the indicators Categories addressed within the framework are not reducible or susceptible to quantitative measurement; and
- quantitative data are not available for many of those which would benefit from quantitative measurement.
- Evidence can be derived for the assessment of qualitative evidence from many different sources, including:
- reports by government, business, civil society and other organisations;
- academic and research centre studies;
- media reports; and
- interviews and discussion groups with key informants.

As with quantitative data, qualitative evidence is derived from particular conceptualisations, scoping and research methods, and should be assessed against this background.

4.8 Perception data

A small number of indicators in the framework are concerned with the perceptions of particular population groups.

The inclusion of users' (and non-users') perceptions and attitudes towards their experience has long been considered an essential part of ensuring effective policy development in ICTs and other sectors. Evidence concerning these is crucial, for example, to understanding the barriers to access and use experienced by women, the use of the Internet by children, and changing views concerning legal and ethical aspects of the Internet. Perception questions are therefore frequently included in household surveys and other selective quantitative studies, as well as qualitative studies using evidence from consultation processes, focus groups and other methodologies.

4.9 Primary research

The indicator framework has been designed to make use of existing available evidence, rather than expecting new primary research to be undertaken.

In some cases, however, it is possible that resources may be available for primary research to be undertaken which could supplement the existing evidence base and fill in some of the gaps that are evident before or become evident during the course of the research. This can build a stronger analysis and recommendations provided that it does not alter the overall context of an investigation (for example by unduly skewing it towards the goals of funding organisations).

Primary research arising from such opportunities would be particularly valuable in areas where evidence proves, in the country in question, to be particularly limited in quantity or quality. This might relate to particular

Categories or Themes (e.g. multistakeholder participation, or the impact of the Internet on children), or to particular types of indicator (e.g. enabling more extensive disaggregation of existing data sets).

A number of different methodologies may be appropriate for primary research if resources are available, including:

- household or other sample surveys, enabling more extensive and more disaggregated data gathering, which might be particularly useful in Category A (Accessibility to All) and Category X (Cross-Cutting) for the gender and children Themes;
- in-depth assessment of performance against objectives of institutional arrangements included in the framework (which might be undertaken in collaboration with relevant government agencies or competent authorities);
- focus groups that could supplement existing published qualitative assessments and information from informants, including different groups of users of the Internet; and
- interviews with a more extensive range of informants than might otherwise be possible.

Any primary research that is undertaken should conform to high professional, ethical and privacy standards – for example, using standard methodologies for the design and sample size of household surveys or for the selection of participants and the conduct of focus groups. Relevant sources concerning this are identified in the relevant chapter in the Indicator Framework..

Action step 5: Data analysis

This section is primarily concerned with the assessment of individual Indicators and the Questions with which they are associated, but extends to the overall assessment of Themes and Categories.

Researchers using the IUIs framework need to ensure that the evidence they use comes from credible and authoritative sources – which may include government departments, academic studies, international agencies, national research institutes and civil society organisations, media and other sources. They should ensure that it reliably addresses questions within the framework and that, if possible, it can be confirmed by reference to other sources.

Assessing individual indicators is more complicated than it sometimes seems. Researchers should take a critically realistic approach and never take evidence at face value. The following paragraphs discuss some general issues and then raise a number of points concerning the three main types of indicator in the framework.

5.1 Assessing evidence in general

Few of the indicators in this framework provide a comprehensive answer to the question with which they are associated. They are merely indicators, whose implications need to be interpreted.

All of the evidence that will be available to researchers will have been gathered in a specific context – at a particular time, in a particular place, using a particular methodology, by an individual or organisation with a particular interest in what that evidence suggests. No matter how authoritative the source, assessment of it requires careful consideration of four things in particular:

1. What is the source? Who gathered the evidence? What was their motive? Do they have a vested interest in finding a particular outcome? What assumptions (and blind spots) may have informed their concept, definitions and scoping?

2. How was the evidence gathered? Was the methodology sound? In the case of quantitative indicators, how reliable or representative is the population from which it was derived (including sample size)? In the case of focus groups, how were participants chosen and how representative were they? In the case of qualitative assessments, how expert and how independent were the authors or reports and other documents?

3. When was it gathered? The Internet and Internet markets are changing rapidly. Data concerned with access, for example, rapidly become out of date. The enjoyment or violation of rights may be affected suddenly by a change of government or other circumstance. Researchers should consider whether data are sufficiently timely to be representative of the current state of Internet development. To avoid incessant updating, which can delay finalisation of the research indefinitely, researchers need to specify a cut-off period, and are advised to have a focus on emerging trends rather than 'snapshot' analysis.

4. What does it show? Does the evidence which has been gathered point to the conclusions that have been drawn? How reliable are these conclusions?

5.2 International norms and standards

A number of indicators in the framework, of all three types, refer to international norms and standards.

- Some of these are contained in treaty or other legally-binding agreements which have been entered into by governments, such as the obligations to support human rights contained in international rights agreements like the ICCPR and the CRC. Also relevant are the goals, targets and indicators established by the UN's 2030 Agenda for Sustainable Development, such as SDG 9.c "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", SDG 16.10 on ensuring public access to information and fundamental freedoms, as well as SDG 5 on achieving Gender Equality.
- Some refer to international agreements which have been reached through UNESCO's intergovernmental processes, in areas including multilingualism and cultural heritage, or which follow agreements of other United Nations or intergovernmental agencies.
- Some have been reached by broad consensus amongst governments, businesses and Internet professionals, such as the targets for access and affordability established the Broadband Commission for Sustainable Development co-chaired by UNESCO and ITU, and the principles underpinning multistakeholder participation that emerged from the World Summit on the Information Society (WSIS) in 2003/2005 and its ten-year review in 2015.
- Similar non-formal standards, benchmarks and targets have been established by non-governmental organisations, particularly in Category R (Rights) and by business associations, particularly in Category O (Openness).

These instruments provide valuable benchmarks against which national Internet environments can be assessed and have been included in the framework where appropriate. Sometimes they are accompanied by comparative quantitative or qualitative indices, which are referenced in the Sources chapter. Regional standards and benchmarks have been agreed in many areas, and these are treated likewise. Interpretation of them should draw on their original source documents, which are identified in footnotes and endnotes, as well as in the Sources chapter.

5.3 Institutional evidence

Institutional evidence is concerned with both:

- the existence of constitutional or legal arrangements concerned with the category and indicator under consideration, and
- the performance of government agencies and other 'competent authorities' in implementing or enforcing them. 'Competent authorities' in this context refers to agencies other than governmental ones which play roles relevant to Internet governance and use.

It should be relatively straightforward to ascertain the existence of formal constitutional and legal arrangements, though it should be remembered that government structures vary considerably and that relevant arrangements may not always be found in the most obvious places.

It will be more difficult for researchers to assess the performance of institutional arrangements. As indicated in section 4.5, evidence concerning this will be derived from a variety of sources with varying degrees of authority, independence, comprehensiveness and credibility. The research team will need to assess this evidence base carefully, reflecting on differences of view between different credible sources, seeking to confirm evidence from multiple sources, and exploring issues in semi-structured interviews with key informants, who should include informants from the institutions concerned and from other stakeholders that interact with them. Researchers should be especially aware of the risk of their own confirmation bias when analysing performance of institutional arrangements. It is also important to assess whether cases that question the extent of implementation be assessed for their broader significance in order to avoid overstating the case as if it were inherently emblematic of a wider trend.

A number of indicators of this type refer specifically to reports by 'credible authorities'. This reference is intended to suggest those who have expertise in the issue addressed by the Indicators concerned, have sufficient information to make reliable assessments, and do not have a particular vested interest to pursue. In this context, "authorities" designates expert sources rather than governmental actors as such.

It should be remembered, too, that the performance of institutional and legal arrangements varies over time, sometimes suddenly or rapidly. The relevance of recent changes in government, laws and regulations should also be borne in mind when assessing qualitative indicators, particularly where these are concerned with policy approaches and with the incidence and implementation of legal and other processes. Researchers should consider the trajectory of performance over time (i.e. whether the desired outcome is more or less observed), as well as the situation at the time of study. Any recommendation that arises should take account of the extent of changes in the gaps between institutional standards and actual implementation trends.

5.4 Quantitative evidence

Quantitative data are sometimes falsely considered as more reliable or objective than other forms of evidence. In practice, statistics can be used in different ways to reach alternative conclusions. Researchers should subject them to the same scrutiny of relevance and reliability as every other form of evidence, including the four questions identified above in Section 5.1. The following paragraphs raise four additional issues that should be borne in mind by researchers.

- The quality of quantitative data depends on the quality and reliability of data gathering. This varies considerably even with official statistics. Some apparently quantitative data (including some national data in some UN data sets) are estimates that draw on previous experience or on data from comparable countries. This is not always clear, although it may sometimes be discovered in endnotes. Household surveys vary greatly in quality because of differences in the size and representativeness of their samples, and the extent to which they follow established data gathering principles. Big data sets, including those used to assess developmental challenges, may be distorted by over-representation of particular groups (those with higher incomes and educational attainment levels, for example, who make more use of Internet, and the commonly urban, male population groups from which those groups are often disproportionately drawn).
- The terminology used to describe measurable phenomena varies between countries and different data sets. The term 'broadband', for example, is used in some countries to describe much higher broadband connectivity than in others, while some data-sets still use the original ITU definition to identify any speed over 256kbps as broadband. Questions asked in household surveys, which may seem ostensibly the same, vary in substance and in detail from one place to another.
- Data concerning ICTs and the Internet are likely to become out of date more quickly than those in other economic sectors because of the pace of change in Internet markets – both in the number of people making use of the Internet, and in the technologies and services in use. Quantitative data concerning access and usage of the Internet that are more than three years old, for example, are already likely to have limited value. Data used should be as close as possible to the date of the assessment.
- Few data in this context offer simple answers; most need some degree of contextual interpretation. The number of mobile broadband subscribers, for example, differs substantially in many countries from that for

mobile broadband subscriptions because many people subscribe to more than one network. The extent to which this happens varies between countries. The meaning of 'active' participation in multistakeholder participatory processes may likewise vary between contexts.

Where researchers have reservations about the quality or reliability of quantitative data, these should be clearly expressed in the final assessment report.

There is, finally, a risk in quantitative analysis that assessment of what is statistically measurable may lead to its being given undue weight at the expense of that which is less quantifiable. Judgement should be exercised by researchers to avoid and mitigate this risk.

5.5 Trends in quantitative data

Where quantitative data sets are recurrent, they can provide evidence of trends which is particularly helpful in identifying where intervention may be most valuable and hence in guiding recommendations for policy and practice. Researchers should take advantage of the availability of recurrent data sets where they are available to add longitudinal perspective to their findings.

Although the indicator framework is intended to provide a snapshot of experience at the time of an assessment, data on experience in previous years should therefore be considered alongside the most recent data available, in order to assess the extent and pace of change.

In some countries, it may be possible to undertake recurrent studies using the IUIs at regular intervals, perhaps every three or five years. This would add substantial additional value to the indicators by enabling observation of changes over time and assessment of the impact of changes in policy and practice that may have resulted from recommendations made in earlier IUI reports. The original findings and analysis may thereby serve as baselines against which changes can be measured.

5.6 Qualitative evidence

Research teams should approach qualitative indicators in the framework with the same degree of scientific rigour as they do quantitative indicators. Many of the points made above in connection with institutional indicators also apply to qualitative indicators.

As with other types of evidence, the research team should consider carefully the quality and reliability of qualitative sources when analysing the assembled data. Three main types of qualitative sources are likely to be available.

The first of these consists of research studies made by diverse stakeholders – including government departments, academics, research centres, civil society organisations and the media – which often use qualitative rather than quantitative methodologies to build an evidence base for their own purposes. These might include, for example, focus group or interview studies in which groups or individuals, purposely chosen to be representative without, however, constituting a generalisable sample, have been used to probe if there are different perceptions on an issue. Findings from such groups are, of course, always merely indicative, and do not represent statistical samples of a population.

Researchers should pay particular attention in these cases to the methodological robustness of the study and potential vested interests of those financing or undertaking the research.

The second type of qualitative sources consists of commentaries made by 'credible authorities' based not on specific research which they have undertaken but on their experience and understanding of the issue under Question. Some of this material will have been written with a distinct (for example commercial or ideological) perspective on a Theme or Question. Researchers should not discount this material but use it with due care and circumspection. They should, firstly, consider whether authors/publishers are 'credible authorities' as defined in Section 5.3 above. If there are significant differences of view within the evidence, they should consider possible reasons for this, and the implications of divergent viewpoints for understanding of the national Internet environment and for possible recommendations. A discussion of divergent viewpoints

can be reflected in the final report, thereby adding to the value of the completed output. Equally, where research teams have doubts about the quality or reliability of qualitative evidence, this should be clearly indicated in their reports.

The third type of qualitative evidence available to research teams will come from their own data gathering, in particular interviews with key informants and group discussions. These are most likely to be effective if they are semi-structured – based on an initial planned series of questions but flexible enough to allow exploration of other issues that might arise. Where possible, interviews and discussions should be recorded for later reference (though only with the consent of all participants).

5.7 Assessment of findings

Researchers are encouraged to structure their data under each indicator in three parts: first, if applicable, any specific metadata about how they have interpreted the meaning of the Indicator; second, the data; and third, a short analysis of the significance of the data as analysed in the light of the question which frames the Indicator concerned. Together, the metadata (if applicable), the data and the analysis will constitute the findings of the assessment.

The assessment of findings (metadata where applicable, data plus analysis) should be the responsibility of the research team as a whole and should, ideally, be concluded with consensus amongst team members. Where it is not possible to reach consensus within the research team, differences should be transparently reflected in the final report (see next section).

UNESCO suggests that assessment should proceed from the bottom up, beginning with consideration of findings on individual Indicators and Questions before these are drawn together for a written brief overall assessment for the particular Theme and, subsequently, for each of the five Categories. Only at the end of this process should the research team consider recommendations for individual Categories as well as any cross-cutting or overarching recommendations.

UNESCO suggests that those team members who have been involved in assessment of a Question or the Questions in a Theme or Category should first discuss their findings with one another. The lead researcher for that area of work should then draw up a short report on the quality of the findings which have emerged from that discussion. This draft should then be refined by those involved before being shared with the research team as a whole. Some of this information may feed into a methodology chapter of the final report.

Research teams may wish to revert to some key informants and others who have been consulted during the project to clarify some data points or to discuss their findings during this phase of work. It may, likewise, be worth consulting members of the Multistakeholder Advisory Group. This may be useful in clarifying findings and resolving differences within the team. Care should be taken, however, to ensure that this does not become a lobbying exercise on the part of those consulted and does not alter research findings which should remain the responsibility of those who have actually conducted the research.

5.8 Comparing questions and indicators

Some research teams may find it helpful to adopt a structured or standardised approach to the comparison of questions and indicators. One method is the adoption of comparable numerical (or 'Likert') scales for the assessment of all three types of indicator (institutional, quantitative, qualitative). In this approach, researchers allocate a numerical value – say, from one to five or one to ten – to their assessment of each of the questions in the framework, basing this on evidence provided by the relevant indicator or indicators. Another approach is a "traffic light" perspective which allocates green, orange and red colours to the assessment of how a country is performing in relation to a given indicator or question.

These kinds of processes have advantages, but also risks:

- They can help to achieve comparability between questions/indicators which fall into the three types described earlier

- They can help to draw out differences of view within the research team (by concentrating discussion on points which are scored significantly differently by different team members).
- They can also help to identify priority areas for policy or practical intervention (by clarifying where the research team as a whole scores current findings relatively low).
- They can focus the mind of individual researchers on the relative importance of different indicators and the relative performance of Internet environments against them.

On the risk side, UNESCO advises against a mechanistic adding-up of rankings to establish an average performance for a given Category. Researchers using this kind of method should thus avoid compounding different scores, as such reductionism would assume that each indicator is of equal value. It would certainly detract from considering performance of individual specific indicators that may be of greater value than others to the specific country concerned.

With these caveats, some researchers for the Media Development Indicators and for pilot implementations of the IUIs have found the Likert scale useful to reach consensus on each individual indicator. Others have preferred less structured ways of reaching a consensus assessment.

5.9 Using international indices

As discussed earlier, the IUIs framework is not intended to provide a basis for cross-country comparisons in the manner of indices like UNDP's Human Development Index and the ITU's ICT Development Index. The IUIs are, rather, intended to support understanding of distinct national Internet environments and the design of appropriate policy responses and practical initiatives to maximise the value of the Internet and minimise risks and problems associated with it at national level. The objective is to harness the implementation of the ROAM principles at the national level.

In some cases, however, there is value in reviewing an individual country's experience within a peer group, whether those within its geographic region or those with comparable development experience or status. It is clear, for example, from ITU data that there is a broad association between levels of Internet access and of GNI per capita. Some countries' access outcomes are better than might have been expected in comparison with other countries that have similar GNI per capita, while others underperform against these peers.

It can therefore be helpful to consider performance levels on specific indicators with a country's ranking on relevant international indices like GNI per capita, the ICT Development Index or the Gender Inequality Index, to judge whether a country is performing better or less well than might have been expected where certain IUI indicators are concerned given the country's overall performance in the more general index. A good example here might be to compare a country's gender digital divide with those of comparable countries in the *Gender Inequality Index*.

Action step 6: Report-writing and recommendations

The final report of an assessment made using the IUIs will vary to some extent between countries according to national contexts and to the objectives established at project initiation. In most circumstances, the report should include both the findings of the national Internet environment and recommendations to government and other stakeholders. These twin elements add value to both national stakeholders and the wider international community concerned with Internet universality. The report should be suitable for publication and may be published by UNESCO after a quality-assurance review (as has been the case with most reports prepared using the Media Development Indicators).

UNESCO suggests that the overall framework for the report to be compiled following an IUI assessment should include the following sections:

a. A brief introduction to the IUIs (to familiarise readers who are not otherwise aware of them), which can draw on the IUI framework;

b. A summary of overall findings (for the framework as a whole rather than individual Categories):
   - a short account of the study, including methodology and participation, which establishes its bona fides, including:
     - a commentary on the approach taken to evidence gathering
     - a note on any primary research that has been undertaken
   - a summary of key findings per Category
   - a commentary on the available evidence base, including:
     - recommendations for improvements in data gathering and analysis
     - a section concerning the priority and/or over-arching recommendations of the assessment

c. Individual chapters for each of the ROAM-X Categories, each including:
   - a section on each Theme within the chapter
   - a paragraph on each Question within the Theme, which will include Indicator metadata (where applicable), the data gathered and the analysis thereof per each indicator
   - recommendations relating to the Category

d. A full compilation of recommendations that have been included in the earlier chapters, structured by targeted stakeholder groups (see section 6.2 below).

e. An appendix including detail on the research process, acknowledgements and sources.

Researchers may also find it useful to consult the reports that have been published following Media Development Indicators assessments and the initial pilot reports of IUIs conducted, which can be found on the UNESCO project website, when preparing their reports.

Reports that are intended for publication by UNESCO should be written in or translated into one of the six languages recognised at the United Nations.

6.1 Report preparation

Different research teams will take different approaches to the drafting and agreement of reports. The overall approach to report writing should be discussed and agreed during initial discussion of the work plan, though this may need to be adapted later in the project.

The findings and recommendations contained in the report should arise from the work done by the research team. The report should, wherever possible, be the consensus view of these team members. To achieve this, UNESCO recommends that drafts should be shared and discussed by the research team as a whole, during report preparation, in order to resolve differences of view before publication. While much of this can be done online, it may be useful to have a joint in-person review workshop for quality assessment of draft findings (see Section 5.7).

It is, however, better to reflect differences of view than to hide them in false consensus or fail to address them adequately, especially where these are significant and substantial. Where it is not possible to reach consensus within the research team, these differences should be reflected in the report. This applies to both analysis and recommendations.

As indicated earlier, research teams may wish to revert to some key informants to clarify some data points or to discuss their findings during this phase of work, without allowing this to become a lobbying exercise on the part of those consulted. Such consultation may include canvassing the most effective ways in which recommendations might be identified, phrased and subsequently implemented.

If a Multistakeholder Advisory Board has been appointed as part of the research project, its members should also be consulted on the draft of the final report. Their views should not alter the research findings but may

be useful in considering how recommendations might most effectively be expressed or implemented by the various stakeholders concerned following publication.

6.2 Drafting recommendations

The value of the IUIs framework lies in its ability to improve understanding of national Internet environments. Thereby, an assessment can facilitate more effective policy and practice which seek to maximise the value of the Internet for the Sustainable Development agenda and minimise risks and problems. Research findings should therefore lead to well-defined recommendations targeted at specific stakeholders. A finding or set thereof may inform a possible recommendation, although not every finding can or should imply a recommendation. Nevertheless, all recommendations should have a foundation in relation to specific findings. A strategic approach is needed in order to keep the list of recommendations at a reasonable length.

National Internet environments differ, and so do the remits associated with particular stakeholder groups such as duty-bearers, rights holders and their representatives, as well as other actors. Different Categories and Themes will require different responses resulting from these differences. Recommendations need to be directed towards those with relevant responsibilities which may include:

- a variety of government departments and agencies;
- businesses concerned with the supply of Internet connectivity and services;
- associations of Internet professionals and Internet governance bodies active in the country (including, for example, those responsible for managing domains);
- national statistical systems, research centres, academics and others undertaking or capable of undertaking relevant research now and in the future;
- civil society organisations, including those concerned with rights, access, development, gender and the lives of children;
- other stakeholders at national level;
- international development agencies that may be interested in funding Internet-related work within the country.

It is beyond the scope of this guide to discuss the kind of policy and practical recommendations that may arise. However, UNESCO suggests four points concerning the scope and presentation of these recommendations that should be borne in mind:

- Recommendations should consider what a country's stakeholders can do to advance Internet Universality overall as well as in terms of the specific individual Categories and Themes. In other words, there is a need to keep in mind the interdependencies in ROAM-X and ensure consistency and complementarity of recommendations.
- Recommendations should relate future development of the Internet to other established national public policy goals, including national development strategies, open government, digital economy strategies, commitments to the Sustainable Development Goals, policies concerned with gender equality, etc.
- Recommendations should recognise that the opportunities presented and challenges posed by the Internet are both short and long term, and bring both into consideration. This should inform the prioritization of issues selected for recommendations that have a significant chance of leading to meaningful impact on the national Internet experience.
- Recommendations should likely include ways to improve the evidence base within the country concerned, drawing attention to areas of data deficiency and suggesting ways in which these might be addressed.

Finally, it may be useful for reports to suggest whether/when a second or subsequent implementation of the indicators might be undertaken. Where a comprehensive assessment has been made using the full indicator framework in the first instance, it may be appropriate to suggest that subsequent recurrent assessments focus on the core indicators..

Action step 7: Organizing of national validation multistakeholder workshop and conducting related advocacy activities

At the end of national assessment process, a national validation workshop should be organized to discuss the assessment results and policy recommendations, involving multistakeholder participants, key policy makers, and major regulatory bodies involved in the research. The event will also discuss the possible actions for future implementations of policy options.

Such a workshop would also provide an opportunity for the discussion of potential implementation processes that might follow from recommendations and might therefore involve a wider range of stakeholders and not only policymakers. It could also propose a timetable to review the extent of implementation and impact of recommendations.

UNESCO, the Multistakeholder Advisory Board as well as the research team should collaborate in organizing this event. UNESCO may also be able to support additional advocacy and awareness-raising activities around the national assessment.

Given that an assessment is a national knowledge-resource, it is important to involve the research and academic community for ongoing use of the study, such as in curricula within a range of relevant disciplines..

Action step 8: Impact assessment and monitoring

After the completion of the national assessments and in due time, UNESCO, the Advisory Group and the research team may be able to support further follow-up actions (for example, technical advice) and mechanisms to monitor and assess the implementation progress and policy improvements. The scope here would be in terms of the recommendations, which – for this purpose as well as for practicality - need enough definition and specificity as to enable measurement of change at a later date. Impact monitoring and evaluation should ideally be done independently of the research team, in order to avoid any potential for self-interest to skew outcomes. If possible, this phase of an assessment should be included in the initial concept and budget.

3.Looking to the future

The Internet is changing very fast. Twenty years ago, Internet access was limited and the range of services available was far narrower than it is today. Mobile Internet and broadband Internet were then in their infancy so far as the general public was concerned; there were no significant social media applications; and video streaming and cloud computing lay in the future. Today, the Internet is changing even more rapidly, alongside other changes in information technology, including the emergence of 5G connectivity, the Internet of Things, big data analysis, algorithmic decision-making, virtual reality, artificial intelligence and advanced robotics.

Researchers should be aware of these rapid and unpredictable developments as they undertake assessments and make recommendations for future policy and practice. Four issues in particular are likely to be significant during the next five years:

- Some questions that are included in the indicators will become less important and others more significant over time. The relative deployment of IPv4 and IPv6, for example, is likely to become less significant as

IPv6 becomes more universally deployed. The impacts of electronic commerce along with the relationship between big data and privacy are likely to become more significant.

- Some indicators will require revisions in value or definition. The meaning of 'broadband', for example, is changing with the level of bandwidth that is generally available. It is still defined in some data sets as any data transfer rate above 256kbps, though this would not be capable of delivering many of the services that are now standard online. Definitional revisions like this should be consistent with those evolved within the UN system.
- It is to be desired that the range and quality of evidence, including quantitative evidence, will improve as policymakers and national statistical systems, among others, become more committed to gathering relevant data and making these public. New international indices are also likely to be prepared by various stakeholders, some of which may be appropriately included alongside those that are currently available.
- Further new developments in technology and markets, which are now emerging or will emerge in future, will impact the ROAM principles and ROAM-X Categories. The present framework includes only a brief assessment of the policy framework concerning them. Relevant indicators are not available for these at present but are likely to become so. Researchers should also be prepared to supplement the existing framework with additional evidence sources as they become available.

4. Engagement with UNESCO

UNESCO aspires to review the indicator framework as a whole, in the light of experience and of changing circumstances, ahead of the biennial meeting of its IPDC Council in 2024.

The views of those who have participated in implementations during the intervening period will be invaluable in that review. UNESCO therefore also invites research teams to submit feedback to UNESCO on their experience of implementing the indicators in their national contexts, which can help to improve the value of the indicators as a research tool for the future.

The online edition of this guide will be updated in the light of experience with implementation.

UNESCO stands ready to support the entire process ranging from establishing the Multistakeholder Advisory Group, to co-organizing events and monitoring the impact. Where suitable, UNESCO will publish the results of a national assessment as part of a dedicated UNESCO publication series. UNESCO will also establish a global online platform to assist the national assessment process and share national exercises in order to facilitate exchange of practices, advocacy activities and policy debates.

Those who are interested to conduct the national assessments of IUIs in their countries are encouraged to express their interest and contact UNESCO through different channels:

- UNESCO project coordination and contact: internet.indicators@unesco.org
- UNESCO Project website: https://en.unesco.org/internetuniversality

To keep updated on the future implementation process of Internet Universality Indicators, stakeholders can sign up to the Internet Universality community and receive periodic emails: https://en.unesco.org/feedback/join-our-internet-universality-community

Annex 1. Members of the Multistakeholder Advisory Board

UNESCO appointed a Multistakeholder Advisory Board, made up of fifteen international experts in different aspects of the Internet, from different regions and stakeholder communities, to advise on implementation of the project. Additional support and advice has been provided by the UNESCO Institute for Statistics. Advice was also sought and received from the Organisation for Economic Cooperation and Development (OECD).

Name	Organization	Stakeholder group	Region
Alexandrine Pirlot de Corbion	Privacy International	NGO	International
Andrea Calderaro	Centre for Internet and Global Politics (CIGP), Cardiff University	Academia	Europe
Demi Getschko	Brazilian Internet Steering Committee (CGI.br)	Technical community and multi-stakeholder body	Latin America and Caribbean
Elettra Ronchi	Organisation for Economic Co-operation and Development (OECD)	Intergovernmental	International
Grace Githaiga	KICTANet	Multi-stakeholder body	Africa
Jasmina Byrne	United Nations Children's Fund (UNICEF)	Intergovernmental	International
Jason Pielemeier	Global Network Initiative (GNI)	NGO	International
Jeanette Hofmann	Social Science Research Center Berlin (WZB)	Academia	Western Europe and North America
Julia Pohle	Social Science Research Center Berlin (WZB)	Academia	Western Europe and North America
Manisha Pathak-Shelat	MICA	Academia	Asia and the Pacific
Mishi Choudhary	Software Freedom Law Centre	Private Sector	Asia and the Pacific
Nibal Idlebi	United Nations Economic and Social Commission for West Asia (ESCWA)	Intergovernmental	International
Sonia Livingstone	London School Economics and Political Science (LSE)	Academia	Europe
Stephen Wyber	International Federation of Library Associations and Institutions (IFLA)	NGO	International
Tarek Kamel	ICANN	NPO	International

Annex 2. Physical Consultation Events

As part of key methodology to develop the Internet Universality indicators, UNESCO has held a series of face-to-face discussions at international, regional, and national events.

These consultations were meant to publicize the project, gather prominent and leading regional experts, and engage with different stakeholders – from Member States, international organizations, technical community, private sector, civil society and NGOs, Internet and legal experts, political scientists, journalists and media experts to students and civil society groups. These activities had an important impact on the project, providing UNESCO with valuable suggestions from interested stakeholders, boosting the number of online submissions, building a sense of ownership of the project, and advocating UNESCO key values regarding human rights, openness, accessibility and multistakeholder participation.

During the first phase of the project (from March to November 2017), 26 consultation events were held in 22 countries, including Argentina, Austria, Belgium, China, Colombia, Estonia, France, Germany, Indonesia, Jamaica, Jordan, Kenya, Panama, Peru, Portugal, Russia, South Africa, Sweden, Switzerland, Thailand, the United Arab Emirates, and Vietnam.

During the second phase of the project (from December 2017 to May 2018), 15 consultation events (including four regional consultation fora) were held in 13 countries, including Brazil, Canada, Egypt, France, Ghana, Italy, Peru, Sri Lanka, Switzerland, Thailand, Tunisia, UK, USA.

During the third phase of the project (from June to September 2018), five consultation events were held in five countries, including France, Georgia, Germany, Ghana, USA.

We estimate that above 2000 experts across all stakeholders groups and regions were consulted during those three phases.

Phase 1 Consultation Events

Events	Dates	Locations	News releases published on UNESCO's website
RightsCon Conference 2017	29-31 March 2017	Brussels, Belgium	UNESCO consults experts on Internet Universality Indicators at Brussels conference
GIG-Arts Paris	30-31 March 2017	Paris, France	UNESCO consults Gig-ARTS Conference on its new project Defining Internet Universality Indicators
Annual Conference of BILETA (British and Irish Law Education and Technology Association)	10-11 April 2017	Braga, Portugal	UNESCO advocates Internet Universality indicators and online freedoms at BILETA conference
World Press Freedom Day	1-4 May 2017	Jakarta, Indonesia	UNESCO consults on developing Internet Universality Indicators during World Press Freedom Day
Stockholm Internet Forum 2017	22 May 2017	Stockholm, Sweden	UNESCO consults on Internet Universality indicators

Events	Dates	Locations	News releases published on UNESCO's website
Africa Internet Summit	30 May 2017	Nairobi, Kenya	Kenya: Internet Governance Forum Conference 2017
European Dialogue on Internet Governance (EuroDIG)	6-7 June 2017	Tallinn, Estonia	UNESCO holds a multistakeholder consultation on Internet Universality Indicators at EuroDIG conference
World News Media Congress	7-9 June 2017	Durban, South Africa	UNESCO promotes source confidentiality study to editors
WSIS Forum	12-16 June 2017	Geneva, Switzerland	UNESCO launches consultation website to define Internet Universality Indicators during WSIS Forum 2017
Global Media Forum	19-21 June 2017	Bonn, Germany	Internet Universality indicators consulted at the Deutsche Welle Global Media Forum 2017
IAMCR 2017	16-20 July 2017	Cartagena, Colombia	UNESCO consults academics on Internet indicators
Asia Pacific IGF	26-29 July 2017	Bangkok, Thailand	UNESCO Internet Universality Indicators consulted at the 8th Asia Pacific Regional Internet Governance Forum
IGF LAC	2-4 August 2017	Panama City, Panama	UNESCO finalizes a series of consultations on Internet Universality Indicators in Latin America
APC member meeting	16-18 August 2017	Johannesburg, South Africa	
Centro de Estudios en Libertad de Expresión y Acceso a la Información (CELE17)	6-8 September 2017	Buenos Aires, Argentina	UNESCO finalizes a series of consultations on Internet Universality Indicators in Latin America
Forum on Internet Freedom in Africa (FIFAfrica)	27-29 September 2017	Johannesburg, South Africa	
IPDC Council informal meeting	28 September 2017	Paris, France	UNESCO Member States encouraged to participate in the framing of Internet Universality indicators during IPDC meeting

Events	Dates	Locations	News releases published on UNESCO's website
Global Privacy and Data protection conference	28-29 September 2017	Hong Kong, China	UNESCO Internet Universality Indicators consulted at 39th International Conference of Data Protection and Privacy Commissioners in Hong Kong
International Seminar on Freedom of Expression, Children's Rights and Media	2-4 October 2017	Lima, Peru	UNESCO finalizes a series of consultations on Internet Universality Indicators in Latin America
Internet Freedom conference	13 October 2017	Vienna, Austria	UNESCO advocates Internet Universality and international human rights standards at the Internet Freedom Conference in Vienna
World Telecommunication Development Conference (WTDC-17)	9-20 October 2017	Buenos Aires, Argentina	UNESCO finalizes a series of consultations on Internet Universality Indicators in Latin America
Moscow: European Journalism Training Association	18-20 October 2017	Moscow, Russia	Russian journalism community and academia engage in UNESCO's project to develop Internet Universality indicators
Jordan Media Institute	24 October 2017	Amman, Jordan	Internet Universality Indicators consultations organized in Amman
Global Media and Information Literacy week	25 October - 1 November 2017	Kingston, Jamaica	Seventh Media and Information Literacy and Intercultural Dialogue (MILID) Conference
ICANN	28 October - 3 November 2017	Abu Dhabi, UAE	UNESCO consults on Internet indicators at ICANN60
Vietnam Internet Forum	27-28 November 2017	Hanoi, Vietnam	Vietnam Internet Forum discusses Internet Universality indicators Use Internet Universality to assess cyberlaws

Phase 2 Consultation Events

Events	Dates	Locations	News releases published on UNESCO's website
North African and African Internet Governance Forum	28 November - 6 December 2017	Sharm El Sheikh, Egypt	UNESCO consults on its draft Internet Universality Indicators at the North African and African Internet Governance Forum in Egypt
Global Voices summit 2017	3 December 2017	Colombo, Sri Lanka	Global Voices summit 2017 participants contribute to UNESCO Internet Universality Indicators
IGF 2017	17-21 December 2017	Geneva, Switzerland	UNESCO consults with participants of the Internet Governance Forum 2017 on the Internet Universality indicators
Global Network Initiative briefing	9 February 2018	Paris HQ, France	UNESCO briefs Global Network Initiative on Internet Indicators
2nd Global Conference of the Internet & Jurisdiction Policy Network	26-28 February 2018	Ottawa, Canada	Jurisdiction experts invited to enrich UNESCO's draft Internet indicators
Regional Consultation Forum in Latin America	5 March 2018	São Paulo, Brazil	UNESCO finalizes a series of consultations on Internet Universality Indicators in Latin America
International Working Meeting on Governance Innovation for a Connected World	8-9 March 2018	Stanford, CA, USA	
Regional Consultation Forum in the Arab states	12-13 March 2018	Tunis, Tunisia	Leading experts from Arab states stress the relevance of Internet Universality Indicators
WSIS Forum 2018	21 March 2018	Geneva, Switzerland	UNESCO promotes Internet Universality indicators to advance SDGs at WSIS Forum 2018
International Journalism Festival	14 April 2018	Perugia, Italy	Journalism community addresses Internet Universality Indicators at the International Journalism Festival
GIG-ARTS Conference	27 April 2018	Cardiff, United Kingdom	Academic community welcomes UNESCO's project to develop Internet Universality Indicators during GIG-ARTS conference

Events	Dates	Locations	News releases published on UNESCO's website
World Press Freedom Day	3 May 2018	Accra, Ghana	World Press Freedom Day 2018
UNESCO design workshop on Internet Universality	3-5 May 2018	Bangkok, Thailand	Internet freedom beyond words: artists and creators capture Internet Universality and its ROAM principles
Orbicom International Symposium	8-9 May 2018	Lima, Peru	Cities can align to SDG 16.10 and Internet Universality to develop sustainably
RightsCon Toronto	16-18 May 2018	Toronto, Canada	UNESCO consults RightsCon stakeholders about implementing Internet Universality Indicators

Phase 3 Consultation Events

Events	Dates	Locations	News releases published on UNESCO's website
EuroDIG 2018	4 June 2018	Tbilisi, Georgia	UNESCO presents second draft of Internet Universality Indicators at EuroDIG 2018
Global Media Forum	11-13 June 2018	Bonn, Germany	UNESCO presents Internet Universality Indicators at Global Media Forum
IAMCR 2018	21 June 2018	Eugene, OR, USA	UNESCO's Internet indicators should assess practical realities – academics
Forum sur la gouvernance de l'Internet	5 July 2018	Paris, France	UNESCO promotes an Open and Inclusive Internet at the Internet Governance Forum of France
Forum on Internet Freedom in Africa 2018	28 September 2018	Accra, Ghana	UNESCO advocated Access to Information and Internet Universality Indicators at FIFAfrica 2018

Annex 3. Online Consultation Submitters

The Internet Universality Indicators have been developed through two phases of consultation.

The first phase of consultation was concerned with the broad themes of Internet Universality and the ways in which they might be encapsulated in an indicator framework. An online consultation platform, in the six official UN languages, was launched at the WSIS Forum on 14 June 2017 and remained open until 31 October 2017. This attracted 198 contributions. This first phase of work enabled the preparation of a draft indicator framework and set of indicators which were set out in the document *Defining Internet Universality Indicators*, published online and offline in December 2017.

A second consultation process was held from 1 December 2017 to 15 March 2018, enabling all stakeholders to respond to this framework and draft indicators. As in the first phase, this second phase included an online consultation in six languages, which received 138 contributions, as well as an interactive platform which received 136 comments.

All submissions can be found online at the following address: http://en.unesco.org/internetuniversality

Submissions received during the phase 1 online consultation, June to October 2017

Governments

Albania IGF / Albania Government	Albania
Bulgarian Ministry of Transport, IT & Communications	Bulgaria
Commission nationale burkinabé pour l'UNESCO	Burkina Faso
Danish Delegation to UNESCO	Denmark
Fundación Museos de la Ciudad - Municipio de Quito	Ecuador
German Commission for UNESCO	Germany
Information Commissioner's Office UK	United Kingdom
Instituto Dominicano de las Telecomunicaciones	República Dominicana
Instituto Nacional de Estadística y Geografía	México
Kenya National Commission for UNESCO	Kenya
Ministerio de Educación de la República Dominicana (MINERD)	República Dominicana
Ministerio de Educación y Ciencia	Guinea Ecuatorial
Ministerio de las Tecnologías de la Información y las Comunicaciones de Colombia	Colombia
Ministerio del Poder Popular para la Educación Universitaria, Ciencia y Tecnología	Venezuela

Ministry of Communications and Technology	Syria
Ministry of Development Planning and Statistics	Qatar
Ministry of Education and Research	Sweden
Ministry of Education and Science	Bulgaria
Ministry of Education and Science of the Russian Federation	Russia
Ministry of Education, Science, Technology and Innovation	Barbados
Ministry of Foreign Affairs - The Republic of Bulgaria	Bulgaria
Ministry of Information Technology and Communications	Republic of Rwanda
Ministry of Interior	Somalia
Ministry of Transport	Austria
Ministry of Transport, IT & Communications	Bulgaria
ONTSI (Red.es - Ministerio de Energía, Turismo y Agenda Digital de España)	Spain
Vanuatu Police Force	Vanuatu

Other public sector

Mansur D. Liman	Federal Radio Corporation Of Nigeria	Nigeria
	Instituto Federal de Telecomunicaciones	México
	Consejo para la Transparencia	Chile
Hannah McCausland	Information Commissioner's Office	United Kingdom

Intergovernmental

Alejandro Patiño	CEPAL	Chile
Ashwini Sathnur	United Nations Development Programme	India
Madeline Salva	World Health Organisation (WHO)	South Pacific
Tatiana Murovana	UNESCO Institute for Information Technologies in Education	Russia
The Freedom Online Coalition (Argentina, Australia, Austria, Canada, Costa Rica, the Czech Republic, Estonia, Finland, France, Georgia, Germany, Ghana, Ireland, Japan, Kenya, Latvia, Lithuania, the Maldives, Mexico, Moldova, Mongolia, Netherlands, New Zealand, Norway, Poland, Spain, Sweden, Tunisia, the United Kingdom, the United States of America).		

Internet technical and professional community

Abdourahamane Ali Soumana	Association Nigérienne pour l'Emergence des TIC	Niger
Constance Bommelaer de Leusse and Nicolas Seidler	Internet Society	Switzerland
Daniel Chong		Malaysia
Gabriela Ramirez		Argentina
Gideon	DotConnectAfrica	Kenya
Gorla Praveen	Swecha	India
Malisa Richards	Internet Society Guyana Chapter	Guyana
Moisés Roberto Escobar	Independent consultant	El Salvador
Omar Zaccardi	FULL SYSTEM	Argentina
Solana Larsen	Mozilla Foundation	Germany
Tao Jin	Women and Children's Hospital of Hubei Province	China
Tom	eQualit.ie	Australia
Tatiana Jereissati	NIC.br/Cetic.br	Brazil
Tom Mackenzie	ITEMS International	France

Private sector

Alexandrs Saulevics	Latvijas Vega	Latvia
Azam Shiri Yeganeh		Iran
Benjamin Uwaigbe	VOGUISH Wifi	Nigeria
Dimitri Martinis	MCM DIGITAL MEDIA	Greece
Hichem Rezgui	E-Energy Magazine	Algeria
Jimson Olufuye	Africa ICT Alliance - AfICTA	Africa
John Acire	Nile Institute of Information and Communication Technology Ltd	Uganda

Lorena Villada	Mastterss G&R	Colombia
Ruben Caicedo	Ninguna	Colombia
Sam Bahour	Applied Information Management (AIM)	Palestine
Said Abdullah Ali Al Ajmi	Oman Telecommunications Co.	Oman

Civil society

Abdelkerim Ousman Toudjani	Action Citoyenne pour l'Information et l'Education au Développement Durable - ACIEDD	Tchad
Abdenour Toubrinet	Algerian Muslim Scouts	Algeria
Adjidjatou Barry Baud	ACSIS	Switzerland
Baudouin Schombe	Centre Africain d'Echange Culturel	République Démocratique du Congo
Carlos Germán Guerrero Argote	Hiperderecho	Perú
Clement Chigbo	Anambra state Rural water supply and Sanitation agency	Nigeria
Denitsa Kozhuharova	Law and Internet Foundation	Bulgaria
Esmeralda Moscatelli	International Federation of Library Associations and Institutions	Netherlands
Federico Giordano	Centro de Estudios para la Gobernanza (CEG)	Argentina
Idowu Adewale	Media Rights Agenda	Nigeria
Jeremy Malcolm	Electronic Frontier Foundation	United States of America
José Eduardo Rojas	Fundación REDES	Bolivia
Julián Casasbuenas G.	Colnodo	Colombia
Mahendranath Busgopaul	Mauritius Internet Governance Forum & Halley Movement	Mauritius
Maheeshwara Kirindigoda	ISOC Sri Lanka	Sri Lanka
Marcos Urupá	Intervozes - Collective Brazil of Social Communication	Brazil
María Florencia Roveri	Nodo TAU	Argentina
Maria Paz Canales	Derechos Digitales	Chile

Marie Jeanne Abega Ndjié	Apeda-c	Cameroun
Mariengracia Chirinos and Scarlet Clemente	IPYS Venezuela	Venezuela
Marwan Abdallah Amish	Sirte homeland for stability and social peace	Libya
Maryant Fernández Pérez	European Digital Rights (EDRi)	European Union
Matilde Carlota Campusmana Díaz	ROTARY	Peru
Mei Lin Fung	People Centered Internet	United States of America
Minna Kylmalahti	Save the Children	Finland
Mohamad	Janzour Association for Voluntee-rism and Development	Libya
Mohammed Saeed	AfICTA	Egypt
Avis Momeni	Protege QV	Cameroun
Muhammad Shabbir	Internet Society, Islamabad Pakis-tan Chapter	Pakistan
Nadim Nashif	7amleh - The Arab Center for the Advancement of Social Media	Israel / Palestine
Nasser Yousfi		Algeria
Nighat Dad	Digital Rights Foundation	Pakistan
Njoya Daouda	Centre d'entraînement aux méthodes d'éducation active du Cameroun (CEMEA-C)	Cameroun
Omar Lozano V.	Responde Diversidad Ac.	México
Peter Micek	Access Now	United States of America
Poncelet Ileleji	The Gambia YMCAs Computer Training Centre and Digital Studio	The Gambia
Raymond Matlala	South African Youth for Internatio-nal Diplomacy	South Africa
Reynaldo Alonso	Unión de Informáticos de Cuba	Cuba
Richard Hill	Association for Proper Internet Governance	Switzlerand
Roman Chukov	Center for International Promotion	Russia
Sandra Chaher	Asociación Civil Comunicación para la Igualdad	Argentina
Sheetal Kumar	Global Partners Digital	United Kingdom

Shu Luo	Beijing Municipal UNESCO Clubs Association	China
Sylvie Siyam	Protege QV	Cameroun
Uirá Porã	Instituto Brazileiro de Politicas Digitais	Brazil
Vladimir Chorny	Red en defensa de los derechos digitales (R3D)	México
Zainab Neekzad Akbari	Equality For Peace And Democracy (EPD)	Afghanistan

Academia

Adrian Schofield	Joburg Centre for Software Engineering (JCSE)	South Africa
Ali Al. Shuaili	Sultan Qaboos University	Oman
Angela Jaquez	Universidad Autónoma de Santo Domingo, Recinto Santiago. (UASD)	República Dominicana
Anna Maria Sganga Forero	IIS Campus Leonardo da Vinci Umbertide	Italy
Bachir Shahi	An-Najah National University	Palestine
Ben Akoh	University of Manitoba	Canada
Carissa Véliz	Uehiro Centre For Practical Ethics, University of Oxford	United Kingdom
Chris Zielinski	Partnerships In Health Information Programme, University of Winchester	United Kingdom
Claudia Padovani	University of Padova	Italy
Cláudio Lucena	Paraíba State University	Brazil
Cristóbal Suárez Guerrero	Universidad de Valencia	Spain
David A. Bray	Harvard Visiting Executive In-Residence	United States of America
Ekaterina Sorokova	MGIMO University	Russia
Elagina Maria	Higher School of Economics	Russia
Emmanuel Angoda	Lira Town College	Uganda
Friedrich Krotz	Center For Media, Communicatin And Internet Research (Zemki), University of Bremen	Germany

Guadalupe Vadillo	Universidad Nacional Autónom de México	México
Hamad Mohamad Salem Al-Azri	Sultan Qaboos University	Oman
Ismael Peña-López	Universitat Oberta de Catalunya	Spain
John Samuel	Not provided	
Jose Luis Mendoza	Centro Latinoamericano de Investigaciones Sobre Internet	Venezuela
Jose Manuel Gomez	Fundacion Metropolitana	Ecuador
Dmitry Kochegurov	Inion Ran	Russia
Lucas Costa dos Anjos	Instituto de Referência em Internet e Sociedade	Brazil
Luz Silvia Roman Cueto	I.E. Cap Fap Jose Quiñones Lima Peru	Peru
Miguel Fadul	Sociedad de Profesionales de las Telecomunicaciones de la Republica Dominicana	República Dominicana
Muratova Nozim	National University of Uzbekistan	Uzbekistan
Nasser Hamdan al Riyami	Sultan Qaboos University	Oman
Oba Abdulkadir LA'ARO	University of Ilorin	Nigeria
Olufemi Samson Adetunji	Federal University of Technology, Akure	Nigeria
Osvaldo I. Larancuent Cueto	Instituto Tecnológico de Santo Domingo (INTEC)	República Dominicana
Paola Barrón	Universidad Nacional Autónom de México	México
Paulo Roberto de Lima Lopes	Telemedecine Academic Network - RUTE/RNP	Brazil
Rashid bin Hamad bin Humaid Al Balushi	Sultan Qaboos University	Oman
Renato Verceis Mader	ESPM	Brazil
Rosa M. Mariño Mesías	Universidad de Andorra	Andorra
Ruben Aroca Jácome	Universidad Católica de Santiago de Guayaquil	Ecuador

Journalism/media

al Abdul Samed Haider Aljabri		Iraq
Frederico Links	ACTION Coalition	Namibia

Farhad Ibragimov	Article Information Agency	Russia
Kassem Khashan al Rikabi	Arab Editors Network / Shomoos Media Foundation / National Center for Journalism	Iraq
Nashilongo Gervasius	Internet Society Namibia Chapter	Namibia
Shreedeep Rayamajhi	RayZnews	Nepal
Sivuyile Sviggy Sesi	Internative Digital	South Africa

Individual capacity

Aleksandr S.	LATVIJAS VEGA	Latvia
Amali De Silva-Mitchell		Sri Lanka
Courtney Radsch		United States of America
Eang Seanghong	RULE	Cambodia
Emilia Correa	Proyecto riquezas en latinoamerica	Argentina
Erika		Argentina
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Submissions received during the phase 2 online consultation, December 2017 to March 2018

Governments

Agence Nationale de Certification Electronique	Tunisia
Agence Nationale de la Sécurité Informatique	Tunisia
Bahrain National Commission For Education, Science and Culture	Bahrain
Comisión Nacional De Telecomunicaciones (CONATEL)	Honduras
Conseil National des Télécommunications	Haiti
Délégation permanente de la France auprès de l'UNESCO	France
Global Affairs Canada	Canada
Information Technology Authority	Oman
Institute of Scientific and Technical Information of China	China
Lao National Internet Center	Laos
Latvian National Commission for UNESCO	Latvia
Mauritius National Commission for UNESCO	Mauritius
Ministère des Postes et Télécommunications	Cameroun
Ministerio de Ciencia, Tecnologia y Telecomunicaciones	Costa Rica
Ministerio de Energía, Turismo y Agenda Digital de España, ONTSI, Red.es	Spain
Ministerio de las Tecnologías de Información y las Comunicaciones	Colombia
Ministry of Communication Technologies and Digital Economy	Tunisia
Ministry of Communications and Information	Singapore
Ministry of Education	Trinidad and Tobago
Ministry of Education and Higher Education	Qatar
Ministry of Education and Research	Sweden
Ministry of Education and Science of the Republic of Latvia	Latvia
Ministry of Education, Science and Technology	Tanzania
Ministry of Education, Science, Technology and Innovation	Barbados

Ministry of Finance, Information Systems Directorate	Bulgaria
Ministry of Public Administration and Communications	Trinidad and Tobago
Ministry of Transport, IT & Communications	Bulgaria
National Broadcasting Council of Poland	Poland
Navodaya Vidyalaya Samiti	India
Oman National Commission for UNESCO	Oman
Pakistan National Commission for UNESCO	Pakistan
Palestinian Legislative Council	Palestine
Permanent Delegation of Finland to UNESCO	Finland
Permanent Delegation of Mexico to UNESCO	Mexico
Permanent Delegation of Romania to UNESCO	Romania
Permanent Delegation of the Kingdom of Denmark to UNESCO	Denmark
Permanent Delegation of the Kingdom of Saudi Arabia to UNESCO	Saudi Arabia
Permanent Delegation of Turkey to UNESCO	Turkey
Portal Brasileiro de Dados Abertos	Brazil
Presidencia de El Salvador	El Salvador
Sri Lanka National Commission for UNESCO	Sri Lanka
Swedish National Commission for UNESCO	Sweden
The Public Library	Saudi Arabia
United States Marine Corps	United States of Americ

Intergovernmental

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Jeremy Malcolm	Electronic Frontier Foundation	United States of America
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Annex 4. Core Internet Universality Indicators

This annex identifies a subset of indicators taken from the complete set in Chapters 4 to 8 of the Internet Universality Indicators. This subset of indicators identifies core indicators which can be used to undertake less comprehensive assessments of Internet Universality where resources are insufficient for a full assessment.

Where the phrase 'aggregate and disaggregated' appears in these indicators, disaggregation should pay particular attention to gender, age, locality, ethnicity and disability.

Category R • Rights

A.1 Is there a legal framework for the enjoyment and enforcement of human rights which is consistent with international and regional rights agreements, laws and standards, and with the rule of law?

Indicator:

- Existence of a constitutional or legal framework, including oversight arrangements, which is consistent with international and regional rights agreements, laws and standards, and evidence that it is respected and enforced by government and other competent authorities

A.2 Is there a legal framework which recognises that the same rights that people have offline must also be protected online?

Indicator:

- Evidence that the principle of online/offline equivalence is accepted and implemented in law and practice

B.2 Are any restrictions on freedom of expression narrowly defined, transparent and implemented in accordance with international rights agreements, laws and standards?

Indicator:

- Legal restrictions on freedom of expression that are consistent with international and regional rights agreements, laws and standards, and evidence that these are respected by government and other competent authorities

B.4 Under what conditions does the law hold platforms and other online service providers liable for content published or shared by users on them?

Indicator:

- Legal framework for intermediary liability and content regulation is consistent with international and regional rights agreements, laws and standards, and evidence concerning proportionality of implementation

C.2 Does the government block or filter access to the Internet as a whole or to specific online services, applications or websites, and on what grounds and with what degree of transparency is this exercised?

Indicators:

- Legal framework for blocking or filtering Internet access, including transparency and oversight arrangements
- Evidence in government and court decisions, and from other credible and authoritative sources, concerning blocking or filtering of access
- Incidence, nature and basis for shutdowns or other restrictions on Internet connectivity
- Numbers and trend of content access restrictions, takedowns of domain names and other interventions during the past three years

C.4 Are individuals, journalists or other online/media actors subject to arbitrary detention, prosecution or intimidation for accessing information online?

Indicators:

- Scope and nature of legal provisions and practice
- Numbers of arbitrary detentions and prosecutions for access to content that is not illegitimate in terms of international agreements as to the circumstances and criteria for permissible restrictions.

D.2 Can non-governmental organisations organise freely online?

Indicator:

- Evidence of online organisation, and absence of undue interference with such organisation

D.3 Are there government policies for e-government and/or e-participation that encourage participation in government and public processes?

Indicators:

- Existence of government policies for e-government and e-participation, including use of the Internet for public consultation
- Values/rankings in UNDESA's e-participation index

E.2 Is the protection of personal data guaranteed in law and enforced in practice, with respect to governments, businesses and other organisations, including rights of access to information held and to redress?

Indicators:

- Legal framework for data protection, including monitoring mechanisms and means of redress, and evidence that it is respected and enforced by government and other competent authorities
- Legal framework concerning the commercial use of personal data and international data transfer/security, including monitoring mechanisms and means of redress
- Existence and powers of an independent data protection authority or similar entity

E.3 Are the powers of law enforcement and other agencies for the lawful interception of user data necessary, proportionate and limited to circumstances which are consistent with international and regional rights agreements, laws and standards? [341]

Indicator:

- Legal framework for the lawful interception of data, including independent oversight and transparency, and evidence concerning implementation by government and other competent authorities

F.1 Do government policies incorporate the Internet in strategies concerned with employment, health and education,[3] with particular reference to ICESCR rights?

Indicators:

- Evidence of inclusion of a) the Internet, and b) respect for ICESCR rights, in sector strategies for employment, health and education
- Evidence of analysis by government of the impact of Internet on employment, health and education

F.2 Are all citizens and other individuals equally able to take advantage of the Internet to participate in cultural activity?

Indicators:

- Extent and nature of differences in Internet access and use between different communities/ethnicities
- Existence of government policy concerning cultural heritage online
- Constitutional or legal guarantee of freedom of artistic expression.

Category O • Openness

A.2 Does the legal and regulatory framework for business, academia and civil society facilitate innovation on the Internet?

Indicators:

- Evidence concerning the conduciveness of the legal and regulatory framework towards the establishment of new business ventures and innovation by academia and civil society
- Perceptions of experience of the regulatory environment for business and ICTs by businesses, including Internet-enabled business

3 These have been selected as representative groups of ESC rights.

B.3 Does the government promote the diversity of intellectual property licensing options including free and open-source software (FOSS)?

Indicators:

- Government policy towards FOSS and other licensing options
- Extent to which software with diverse licensing options are used in government departments

B.4 Does the government promote and adopt standards to facilitate accessibility to the Internet and e-government services for persons with disabilities?

Indicators:

- Government policy and practice towards ensuring accessibility for persons with disabilities
- Perceptions of persons with disabilities concerning accessibility policy and practice

C.1 Is there independent regulation of communications markets, undertaken in accordance with international norms and standards?

Indicators:

- Existence of an independent regulatory authority.ies
- Evidence concerning regulatory performance, including perceptions of the quality of regulation by communications businesses, consumer associations and other organisations

C.4 Is there sufficiently effective competition in communications access networks to protect consumer interests?

Indicators:

- Number of fixed and mobile broadband providers
- Market shares of fixed and mobile broadband providers

D.4 Does the government encourage the use of open educational resources (OER) and facilitate open access to academic and scientific resources?

Indicators:

- Educational policy framework concerning OER
- Arrangements for access to academic and scientific resources by higher education institutions and students

D.5 Does the government require ISPs to manage network traffic in a way that is transparent, impartial and neutral, without discriminating against particular types of content or content from particular sources?

Indicator:

- Regulatory arrangements and practice concerning net neutrality and competition for online and network services

E.1 Has legislation been enacted which requires open access to public and publicly-funded data, with appropriate privacy protections, and is that legislation implemented?

Indicators:

- Existence of a legal framework for access to open data which is consistent with international norms[342] and privacy requirements
- Evidence concerning the extent to which open data resources are available and used online

E.2 Do government departments and local government agencies have websites which are available in all official languages and through all major browsers?

Indicators:

- Government policy to ensure provision of websites with appropriate language and browser access, and evidence concerning effective implementation
- Proportion of government services with websites (value/ranking in UNDESA online services index)

Category A • Accessibility to All

A.1 Is statistical information concerning access and use of Internet regularly gathered by national statistical systems and/or other competent authorities, on a systematic basis?

Indicators:

- Arrangements for gathering aggregate and disaggregated statistical information, from diverse sources, including the inclusion of relevant questions in household surveys
- Availability of independent household surveys and other evidence concerning aggregate Internet access and use

A.4 Does the government have a policy and programme to implement universal access to reliable, affordable broadband, and is this effectively implemented?

Indicators:

- Adoption of a universal access strategy and evidence of effective deployment of UA resources
- Statistical evidence of progress towards universal access, aggregate and disaggregated[4]

4 With particular reference e.g. to gender, age, locality, ethnicity and disability

B.1 What proportion of the population uses the Internet, with what frequency, and is this proportion growing?[5]

Indicators:

- Proportion of individuals who have ever accessed the Internet, aggregate and disaggregated
- Proportion of households with Internet access[343]
- Number of Internet users per hundred population, aggregate and disaggregated, by frequency of use[344]
- Number of social media (social networks, microblogs, messaging, user-generated video streaming)[6] users per hundred population, aggregate and disaggregated
- Number of visits to social media websites (defined as above) per hundred population

B.3 What proportion of the population subscribes to communications/broadband services, and is this growing?[7]

Indicators:

- Percentage of individuals who own a mobile phone, aggregate and disaggregated[345]
- Number of fixed broadband subscriptions per hundred population, aggregate and disaggregated[346]
- Number of unique active mobile broadband subscribers per hundred population, by bandwidth, aggregate and disaggregated[347]

B.4 What barriers to access are identified by users and non-users of the Internet?

Indicator:

- Perceptions (by users and non-users) of barriers to their Internet access and use, aggregate and disaggregated,[8] from household surveys and/or other sources.

C.1 Are mobile handsets capable of Internet connectivity affordable to all sections of the population?[9]

Indicators:

- Cost of a) entry-level[348] mobile handset and b) smartphone as a percentage of monthly GNI *p.c.*
- Perceptions of affordability by users and non-users, aggregate and disaggregated

C.2 Is broadband[349] access and use affordable to all sections of the population?[10]

Indicators:

- Monthly cost of entry-level[350] fixed broadband connection and use as a percentage of monthly GNI *p.c.*

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5 Disaggregation should pay particular attention to gender, age, locality, ethnicity and disability.

6 It should be noted that the incidence of social media platforms varies between countries.

7 Disaggregation should pay particular attention to gender, age, locality, ethnicity and disability.

8 Disaggregation should pay particular attention to gender, age, locality, ethnicity and disability.

9 See endnote. Assessments should note different definitions of 'entry level' between countries and over time. Disaggregation should pay particular attention to gender, age, locality, ethnicity and disability.

10 See endnotes. Assessments should note different definitions of 'broadband' and 'entry level' between countries and over time.

- Monthly cost of entry-level[351] mobile broadband connection and use as a percentage of monthly GNI *p.c.*
- Availability or otherwise of zero-rated or low-cost access

D.1 Are there significant differences in broadband access and use between regions and between urban and rural areas?

Indicators:

- Geographical coverage of broadband networks in urban and rural areas, by level of bandwidth
- Numbers of mobile broadband subscribers and of Internet users, aggregate and where possible disaggregated between urban and rural areas and in different regions

D.5 Do adults in all age groups make use of the Internet to the same extent?

Indicators:

- Proportion of adults in different age groups who are using the Internet, and frequency and type of use[11], including disaggregation by gender
- Perceptions of barriers to Internet access and use, and of the value of Internet access and use to end-users (where available), disaggregated by age and sex

E.1 How many Internet domains and servers are there within the country?

Indicators:

- Number of registered domains (including ccTLDs, gTLDs[352] and IDNccTLDs) per thousand population, and trend where available
- Number of secure webservers per million population, and trend where available

E.4 Is there a substantial and growing volume of Internet content[12] in diverse local and indigenous languages, including locally-generated content?

Indicators:

- Proportion of population whose principal language and script are available on leading online services
- Availability of content on government websites in all languages with significant user groups within the population

F.1 Do school and higher educational curricula include training in ICTs and media and information literacy, focused on effective and safe use, and are these curricula implemented in practice?

Indicators:

- Policy concerning school curricula, including media and information literacy, intercultural dialogue and training in ICT skills

11 "Type of use" means the various activities that Internet users conduct online such as using social media, browsing web news, playing games, checking emails, etc.

12 This should include text, audio and video content.

- Evidence of appropriate educational curricula at primary, secondary and tertiary levels
- Proportion of teachers in primary and secondary schools with training in ICTs or the use of ICTs in education
- Proportion of schools with Internet access
- Proportion of learners who have access to the Internet at school

F.3 What proportion of the population and the workforce is skilled in the use of ICTs?[13]

Indicators:

- Proportion of Internet users with particular Internet skills, by skill type (basic, intermediate, advanced), aggregate and disaggregated[353]
- Proportion of the workforce using ICTs in the workplace, by skill type (basic, intermediate, advanced), aggregate and disaggregated
- Proportion of tertiary education students enrolled in STEM[14] and ICT courses, disaggregated by sex, compared with global averages

Category M • Multistakeholder Participation

A.1 Is there an overall policy, legal and regulatory framework for Internet development and policymaking which is consistent with international norms?

Indicators:

- Existence of an overall framework consistent with relevant international norms[354]
- Existence of legal and regulatory frameworks to enable e-commerce, digital signatures, cybersecurity, data protection and consumer protection

B.2 Does the government actively involve other stakeholder groups in developing national Internet policies and legislation?

Indicators:

- Existence of arrangements for multistakeholder consultation and involvement in national policymaking institutions and processes concerned with the evolution and use of the Internet
- Numbers of non-governmental stakeholders actively participating, by stakeholder group, disaggregated by sex

13 Disaggregation should pay particular attention to sex, age, locality, ethnicity and disability.

14 i.e. science, technology, engineering and mathematics.

B.3 Is there a national Internet Governance Forum and/or other multistakeholder forum open to all stakeholders, with active participation from diverse stakeholder groups?

Indicators:

- Existence of national IGF and/or other multistakeholder forum concerned with Internet governance
- Participation data for national IGF or other fora, aggregate and disaggregated by sex and stakeholder group, with particular attention to participation by selected groups (e.g. education ministries, SMEs, NGOs concerned with children, trades unions), and including arrangements for remote participation

C.2 Do government and other stakeholders from the country actively participate in major international fora concerned with ICTs and the Internet?

Indicators:

- Number of participants from different stakeholder groups participating in global and regional IGFs, per million population, aggregated and disaggregated by stakeholder group and sex
- Participation or otherwise of non-government stakeholders in official delegations to ITU, aggregated and disaggregated by stakeholder group and sex

C.3 Does the government and do other stakeholders participate actively in ICANN?

Indicators:

- Membership of and active participation in ICANN's Governmental Advisory Committee (GAC)
- Membership of and active participation in ICANN constituencies, working groups and other fora.

Category X • Cross-Cutting Indicators

A.1 Are the interests and needs of women and girls explicitly included in national strategies and policies for Internet development, and effectively monitored?

Indicators:

- National strategies include explicit consideration of a) women's needs relating to the Internet and b) the potential of the Internet to support women's empowerment and gender equality
- Numbers of women and men in senior policymaking positions in government concerned with ICTs/Internet
- Extent of disaggregation of available data on ICT access and use by sex
- Existence of national mechanisms to monitor women's inclusion in strategies for Internet access and use

A.2 Is there a gender digital divide in Internet access and use and, if so, is this gender divide growing, stable or diminishing?

Indicators:

- Proportions of individuals using the Internet, disaggregated by sex, compared with gender gaps in income and educational attainment
- Proportions of adult women and men with mobile broadband subscriptions disaggregated by sex, compared with gender gaps in income and educational attainment
- Survey data on Internet awareness and on patterns of Internet use, disaggregated by sex
- Perceptions of barriers to Internet access and use, and of the value of Internet access and use, disaggregated by sex

A.5 Do the law, law enforcement and judicial processes protect women and girls against online gender-based harassment and violence?

Indicators:

- Existence of a relevant legal framework and judicial processes
- Incidence of online gender-based harassment and violence experienced by women and girls
- Evidence of government, law enforcement and judicial action to provide protection to women against online gender-based harassment and violence
- Existence of online services which are intended to protect women against online gender-based harassment or support those affected by it

B.3 How do children perceive and use the Internet?[15]

Indicators:

- Perceptions of the Internet among children derived from surveys, including barriers to use, value of use and fears concerning use, aggregate and disaggregated
- Data on use of the Internet by children, aggregate and disaggregated, compared with other age groups (e.g. data on location, frequency and type of use)

B.4 Is there a legal and policy framework to promote and protect the interests of children online, and is this effectively implemented?

Indicator:

- Existence of a policy framework and legal protections consistent with the Convention on the Rights of the Child (CRC), and evidence that this is implemented by government and other competent authorities

15 Disaggregation should pay particular attention to gender, age, locality, ethnicity and disability.

C.1 Do national and sectoral development policies and strategies for sustainable development effectively incorporate ICTs, broadband and the Internet?

Indicator:

- Existence of a recent, comprehensive policy for the development of ICTs, broadband and the Internet, which includes consideration of likely future developments in these fields

C.7 What proportion of businesses, including small and medium sized businesses make use of the Internet and e-commerce?

Indicators:

- Proportion of SMEs using the Internet, by type of access
- Perceptions of the value of Internet use by SMEs

D.1 Is there a national cybersecurity strategy, with multistakeholder engagement and aligned with international human rights standards, including a national computer emergency response team (CERT) or equivalent?

Indicators:

- Existence of cybersecurity strategy, with multistakeholder involvement, which is consistent with international rights and norms
- Establishment of national CERT or equivalent, and evidence concerning its effectiveness

D.4 Have there been significant breaches of cybersecurity in the country within the last three years?

Indicators:

- Incidence and nature of breaches reported, and numbers of individuals and businesses affected
- Perceptions of Internet security among users, businesses and other stakeholder groups
- Data concerning phishing, spam and bots in national level domains

E.3 How do individuals perceive the benefits, risks and impact of the Internet within the country?

Indicator:

- Perceptions of the benefits, risks and impact of the Internet, derived from household or opinion surveys, disaggregated by sex

E.4 Do Internet users report experiencing significant harassment or abuse at the hands of other Internet users which deters them from making full use of the Internet?

Indicators:

- Availability of reporting mechanisms for online harassment or abuse, including reporting arrangements by online service providers
- Data on the extent to which Internet users report harassment or abuse, with particular attention to specific demographic and social groups (including women, ethnic and other minorities, and civil activists)

Endnotes

1 See UNESCO, *Knowledge Societies Handbook*, http://en.unesco.org/sites/default/files/knowledge_socities_policy_handbook.pdf
2 See, among its outcome documents, the *Geneva Declaration of Principles,* http://www.itu.int/net/wsis/docs/geneva/official/dop.html, and the *Tunis Agenda for the Information Society*, http://www.itu.int/net/wsis/docs2/tunis/off/6rev1.html
3 http://www.unesco.org/new/en/communication-and-information/about-us/
4 The original concept was developed in 2013 in a UNESCO discussion paper which can be found at http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/CI/CI/pdf/news/internet_universality_en.pdf
5 http://unesdoc.unesco.org/images/0023/002340/234090e.pdf
6 http://unesdoc.unesco.org/images/0023/002325/232563E.pdf
7 https://sustainabledevelopment.un.org/post2015/transformingourworld
8 http://unesdoc.unesco.org/images/0016/001631/163102e.pdf
9 Seventeen national media development reports using these indicators can be found at http://www.unesco.org/new/en/communication-and-information/resources/publications-and-communication-materials/publications/publications-by-series/assessments-based-on-unescos-media-development-indicators/
10 https://unesdoc.unesco.org/ark:/48223/pf0000260893
11 http://unesdoc.unesco.org/images/0021/002178/217831e.pdf
12 http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/CI/CI/pdf/unesco_mil_indicators_background_document_2011_final_en.pdf
13 See http://www.itu.int/en/ITU-D/Statistics/Pages/intlcoop/partnership/post2015.aspx. The Partnership includes 14 United Nations and other international agencies.
14 Lists of these countries can be found at http://www.unohrlls.org/
15 https://data.worldbank.org/indicator/NY.GNP.PCAP.PP.CD. It is also one component of the Human Development Index, contextual indicator 3A.
16 *Ibid.*
17 https://data.worldbank.org/indicator/NV.SRV.TETC.ZS
18 https://esa.un.org/unpd/wpp/Download/Standard/Population/
19 http://apps.who.int/gho/data/node.main.688
20 http://hdr.undp.org/en/composite/HDI
21 https://esa.un.org/unpd/wpp/Download/Standard/Population/.
22 These data require a subscription, but may be available through subscriptions held by researchers' organisations, e.g. government departments and universities: https://www.ethnologue.com/browse/countries. See also UNESCO, *Measuring Linguistic Diversity on the Internet*, 2007, http://unesdoc.unesco.org/images/0014/001421/142186e.pdf
23 https://esa.un.org/unpd/wup/
24 See successive ITU *Measuring the Information Society* reports, *e.g.* http://www.itu.int/en/ITU-D/Statistics/Pages/publications/mis2016.aspx
25 http://hdr.undp.org/en/composite/HDI
26 http://data.uis.unesco.org/Index.aspx?queryid=242. Mean years of schooling is also included in the Human Development Index, contextual indicator 3A.
27 http://hdr.undp.org/en/composite/HDI
28 https://data.worldbank.org/indicator/SE.ADT.LITR.ZS
29 http://www.indexmundi.com/facts/indicators/EG.ELC.ACCS.ZS
30 https://www.indexmundi.com/facts/indicators/SI.POV.GINI/rankings
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341 Issues concerning surveillance are addressed in the 2014 resolution of the UN General Assembly concerning 'privacy in the digital age,' http://www.un.org/en/ga/search/view_doc.asp?symbol=A/RES/69/166
342 *e.g.* the Open Data Charter, https://opendatacharter.net/#
343 This indicator is included in the ITU ICT Development Index
344 This indicator is included, at aggregate level, in the ITU ICT Development Index
345 This indicator is included in the ITU ICT Development Index from 2018 (data from earlier editions of the Index is concerned with subscriptions to rather than ownership of mobile phones).
346 This indicator is included in the ITU ICT Development Index, with greater detail concerning bandwidth from 2018
347 This indicator is included in the ITU ICT Development Index, with greater detail concerning bandwidth from 2018

348 The definition of 'entry-level' may differ in different countries. The GSMA's approach to this is included in its *Mobile Connectivity Index Handbook*, at https://www.mobileconnectivityindex.com/widgets/connectivityIndex/pdf/Mobile_Connectivity_Index_Methodology_10072017.pdf. P.9

349 The definition of 'broadband' varies from place to place and time to time. Some indices still define broadband as downstream speeds equal to or greater than 256 kbps. However, this would not be considered broadband in most communications markets now.

350 See endnote to previous question.

351 See endnote to previous question.

352 These can be geolocated through the WHOIS database.

353 An overall indicator for this is included in the ITU ICT Development Index from 2018 onwards. See also ITU, Digital Skills Toolkit, 2018, https://www.itu.int/en/ITU-D/Digital-Inclusion/Documents/ITU%20Digital%20Skills%20Toolkit.pdf

354 *e.g.* the African Union Declaration on Internet Governance. https://afigf.org/sites/default/files/DeclarationonInternetGovernance_adoptedAUSummit2018.pdf OECD Internet Policy Making Principles for OECD countries, https://www.oecd.org/sti/ieconomy/oecd-principles-for-internet-policy-making.pdf