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DEFINING INTERNET UNIVERSALITY INDICATORS

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UNESCO'S INDICATORS FOR INTERNET UNIVERSALITY

EXECUTIVE SUMMARY

UNESCO launched its concept of Internet Universality in 2014. The concept, which was endorsed by UNESCO's General Conference, roots the future of the Internet in four core themes, which are concerned with Rights, Openness, Accessibility to All and Multistakeholder Participation. Together these are known as the ROAM Principles.

UNESCO has developed a framework of Internet Universality indicators to assist governments and other stakeholders to assess their national Internet environments and develop policies to advance these Principles. These indicators, which are comparable to the *Media Development Indicators* adopted by UNESCO in 2008,¹ are intended for use by governments and other stakeholders (from any group or sector) in interested countries where resources can be mobilised to undertake national assessments. The aim of applying the indicators is to identify achievements and gaps within a country in relation to Internet Universality, and to make appropriate recommendations concerning policy and practice. They are not intended to rank countries in comparison with one another.

The Internet Universality indicators have been developed through a process of desk research and consultation, undertaken by UNESCO with the support of a consortium which has been led by the Association for Progressive Communications (APC) and includes *ict* Development Associates, LIRNEasia and Research ICT Africa. The advice of the project's Multistakeholder Advisory Board and of the UNESCO Institute for Statistics (UIS) has also been sought during the project.

The main indicators are set out in Chapters 4 to 8 of this report. Chapter 4 includes indicators concerned with Rights, Chapter 5 with Openness, Chapter 6 with Accessibility to All, Chapter 7 with Multistakeholder Participation, and Chapter 8 with Cross-Cutting Indicators. A set of contextual indicators is included in Chapter 3. A set of core indicators, drawn from those in Chapters 4 to 8, is included in Chapter 9.

The first phase of consultation, which lasted from 29 March to 31 October 2017, was concerned with general principles. That consultation included 24 face-to-face consultation meetings in 21 countries and attracted 165 written and online contributions. This report follows a second phase of consultation on a first draft of indicators which lasted from 1 December 2017 to 15 March 2018, included 12 face-to-face consultation meetings in 10 countries and attracted 148 written and online contributions. The draft indicators have been revised in light of this second consultation. Feasibility testing and part-piloting of the indicators will take place between May and August 2018. The final draft indicators will be considered in November 2018 by the International Council of UNESCO's International Programme for the Development of Communication (IPDC).²

CHAPTER 1 - UNESCO'S INTERNET UNIVERSALITY INDICATORS PROJECT

The evolving Internet

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 communications medium that has transformed 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. Understanding and assessing its development and its impact on emerging Knowledge Societies has become more complex as it has evolved.

It will continue to become more complex in future because the Internet is also in constant change. Its open architecture has facilitated innovation. New developments in technology, access devices and services have continually created 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, including the Internet of Things and algorithmic decision-making, will continue to alter the nature of the Internet and its impact on economies and societies, including the United Nations' goals for achieving sustainable development (the Sustainable Development Goals or SDGs). Our understanding of the Internet must evolve alongside its technology and services.

Inclusiveness has been a major concern of international discourse on the Internet since 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 higher and lower incomes and higher and lower 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 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 is concerned both with the integrity of the network and with 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, hate speech and 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 engaged with this agenda for many years, emphasising the Internet's potential within its goal of developing Knowledge Societies,³ based on freedom of expression, universal access to information and knowledge, respect for cultural and linguistic diversity, and quality education for all. UNESCO played a leading 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 established multistakeholder approaches in Internet governance.⁴ UNESCO has played a leading part since WSIS in the Internet Governance Forum, held 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 the work of UNESCO's Communication and Information Sector, as well as to its work in education, culture, natural and social science.⁵

UNESCO sees the Internet as much more than an aggregation of infrastructure and applications. It considers it as a network of economic and social interactions and relationships, reaching far beyond technology, which has great potential to enable rights, empower individuals and communities, and facilitate sustainable development. It poses challenges to established economic and social norms, which can have both positive and negative impacts on economic, social and developmental outcomes, while the ways in which it is integrated within public policy and practice raise challenges of equality, inclusiveness and rights. All these aspects form part of the complex Internet environment which can be explored and enhanced through Internet Universality.

Internet Universality

UNESCO launched its concept of Internet Universality in 2013. This concept highlights features of the internet which UNESCO believes are fundamental to fulfilling its potential for building knowledge societies and achieving sustainable development.⁶

This concept was developed 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*,⁷ held in Paris in March 2015, and publication of the expert report *Keystones to foster inclusive Knowledge Societies*.⁸ The concept was endorsed by UNESCO's General Conference in 2015.

The concept of Internet Universality highlights the behavioural norms and values that underpin the Internet, and the need to strengthen these, as the Internet becomes more pervasive in human affairs, to ensure that it becomes ubiquitous, helps to realise our aspirations, and reflects general participation in its development and governance. Understanding the internet in this way helps to draw together different facets of its ecosystem which are concerned with technology and public policy, rights and development.

Internet Universality embraces four principles – the R-O-A-M principles – which have been and should continue to be fundamental to the development of the internet.

- 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**.

These are illustrated in Figure 1.

Figure 1 – Internet Universality



Source: APC

Internet Universality emphasises the importance of understanding the development of the Internet holistically, including the interaction between these principles. It draws together different strands of UNESCO's work concerned with building Knowledge Societies and dialogue on the evolution and governance of the Internet amongst diverse stakeholder communities.

This holistic approach to the Internet should enrich discussion about the role which it can play in facilitating achievement of the United Nations' *2030 Agenda for Sustainable Development*.⁹ 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.¹⁰

While the concept of Internet Universality and the 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 designed to foster opportunities and mitigate risks arising from them. This should be borne in mind during investigations using this indicator framework.

Internet Universality indicators

The Internet Universality indicators which are proposed below draw on UNESCO's previous experience with indicator frameworks concerned with media and communications. UNESCO has agreed a number of other indicator frameworks which can be used voluntarily by Member States and other stakeholders to assess aspects of the communications environments in their countries and develop policy approaches that will enhance the quality of those environments.

- UNESCO's *Media Development Indicators* (MDIs), which were adopted at the 26th session of the International Council of the International Programme for Development and Communication (IPDC) in 2008,¹¹ have subsequently been used in more than 30 countries.¹²
- IPDC adopted further indicators, based on these MDIs, for the safety of journalists in 2013.¹³
- *Gender-sensitive Indicators for Media* were put in place in 2012.¹⁴
- Indicators concerned with media and information literacy have also been published.¹⁵

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

At its 29th session in November 2014, the International Council of the IPDC authorised 'continued work in standard setting through the elaboration and application of indicators relevant to media development',¹⁶ building on experience with the MDIs. The outcome document from the *CONNECTing the Dots* conference in 2015 also called for 'further research' to be undertaken into 'law, policy, regulatory frameworks and the use of the Internet, including relevant indicators.'¹⁷ The proposals for Internet Universality indicators in this document follow work that has been undertaken to implement these mandates.

Development of the indicator framework

UNESCO's work to develop Internet Universality indicators has been supported by the Swedish International Development Agency and the Internet Society.

A consortium led by the Association for Progressive Communications (APC) was appointed to undertake their development work in conjunction with UNESCO in June 2017. In addition to APC, this consortium includes *ict* Development Associates and three regional ICT research institutes LIRNEasia and Research ICT Africa.¹⁸

UNESCO appointed a Multistakeholder Advisory Board, made up of twelve international experts¹ in different aspects of the Internet, from different regions and stakeholder communities, to advise on implementation of the project as it proceeds. Additional support and advice has been provided by the UNESCO Institute for

¹ Ms Jasmina Byrne, Mr Andrea Calderaro, Ms Mishi Choudhary, Mr Demi Getscko, Ms Grace Githaiga, Ms Jeanette Hofmann (with Ms Julia Pohle as substitute), Ms Nibal Idlebi, Ms Sonia Livingstone, Ms Manisha Pathak-Shelat, Mr Jason Pielemeier, Ms Alexandrine Pirlot de Corbion, Mr Stephen Wyber

Statistics. A meeting to gather advice and experience concerning the indicators was also held with the Organisation for Economic Cooperation and Development (OECD).

The project has been developed through two phases of research and consultation.

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.

The consultation process also had two elements:

- a. An online consultation, in six languages, was launched at the WSIS Forum on 14 June 2017 and remained open until 31 October 2017. This attracted 165 contributions.
- b. Consultations meetings and workshops were held at 24 international, regional and national events, in 21 countries, concerned with the Internet between 29 March and 31 October 2017.

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.

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:

- An online consultation in six languages, which received 147 contributions.
- Consultation meetings and workshops at 12 international, regional and national events which were held in ten countries between 1 December 2017 and 15 March 2018. These included regional consultation events in the Asia-Pacific, Africa, Latin America and Caribbean, and Arab States regions.

The framework and draft indicators, as revised in light of this second consultation, are set out in this document. Feasibility assessments of these indicators will take place in two countries during May 2018. These are intended to assess the process and viability of obtaining evidence to assess each of the indicators included in the framework. Part-pilots of the indicators, exploring actual evidence, will be undertaken in several countries between June and August 2018.

The final report of the Internet Universality Indicators project will be considered at the 31st meeting of the IDPC Council in November 2018.

CHAPTER 2 - THE INTERNET UNIVERSALITY INDICATORS FRAMEWORK

Requirements of an indicator framework

The indicator framework 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 would enhance those environments and their adherence to 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, therefore, their application will vary between countries according to those countries' different circumstances. The indicators are *not* intended either to provide the basis for an index of national performance or to make comparisons between countries. Periodic assessments within a country would, however, provide a good basis for assessing the development of a national Internet environment over time.

All indicator frameworks need to balance the range of issues which they cover with the capacity of users to gather and analyse the necessary data/information. The indicator framework proposed in this report does not include all the issues that could be included in assessing a national Internet environment. This is intentional. Other frameworks, including some designed by other UN agencies, address other aspects of the Internet environment in greater detail, and these are referenced in this framework where appropriate.

The framework in this document is intended as a research toolkit aimed at improving understanding of the national Internet environment through a collage of quantitative and qualitative indicators. It focuses on those issues which are central to UNESCO's mandate and therefore to its concept of Internet Universality. Each of the five ROAMX Categories raises a number of questions and related indicators. These have been selected to allow as comprehensive an assessment as possible to be made with the resources that are likely to be available in practice.

The indicator framework has been designed to be used by diverse stakeholders, including governments, international organisations, civil society organisations and multistakeholder groups drawn from the various communities that are concerned with Internet development, access and rights. Experience with the MDIs has shown that valuable outcomes can emerge from each of these interest groups, as well as demonstrating the value of multistakeholder engagement in research.

UNESCO hopes that the indicator framework will be used as a whole, but recognises that this requires significant resources in research time and expertise. A shorter, more concentrated and more selective set of core indicators has therefore also been provided in Chapter 9. These have been taken entirely from the full framework set out in Chapters 4 to 8.

UNESCO also recognises that some governments and other stakeholders may wish to undertake partial assessments built around issues that are of particular concern to them.

Many of the proposed questions/indicators also allow researchers to pay additional attention to issues which are of contextual relevance or particular interest to them. Individual categories or subsets of indicators could be used, for example, to explore particular dimensions of the national Internet experience. The framework has been designed with the aim of facilitating this as well as comprehensive assessments.

Contextual differences between countries (and regions within countries) will be significant in investigations. Priority issues and circumstances will also change over time. Where change is rapid, as in the Internet, overly detailed selection of questions and indicators may offer insufficient flexibility for investigations to consider local contexts. The questions and indicators in this document have been designed to provide appropriate contextual flexibility within a framework that has universal relevance. Chapter 10, which is concerned with sources and means of verification, provides guidance concerning the use of generic sources and statistical sources which are available at the time of publication.

Data challenges

All indicator frameworks depend, where their application is concerned, on the quality of data or other information that is available for consideration. Quantitative data are available for some aspects of the ROAM framework, while others are more susceptible to qualitative assessment. Sources of indicators for the framework therefore fall into three main categories:

- quantitative indicators, which use data derived from official statistics and other comprehensive data-gathering processes where these are available, including household and other professionally-conducted quantitative surveys, private sector data gathered by Internet businesses where this is 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 might 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.

Together, these indicators form a collage of information which brings together a wide range of evidence and reinforces synergies amongst the Principles/Categories that make up Internet Universality.

Not all indicators will be available in all cases. Indeed, it may be difficult to assess some of the questions and indicators adequately in some countries because of lack of data. However, even where this is the case, the range and diversity of indicators included in the framework should enable this collage to provide sufficient evidence of the Internet environment as a whole for comprehensive assessments and for recommendations concerning policy and practice.

There are substantial gaps in the statistical data that are available for analysis, even, in some countries, where data concerning access to the Internet are concerned. Data analysis also needs to be undertaken with a clear understanding of the nuances affecting different contexts. 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. Household surveys, which are important for disaggregating access and usage between urban and rural areas, genders and generations, are undertaken frequently in some countries, rarely or never in others, while the questions asked vary between surveys and between countries.

Data deficits are particularly acute in Least Developed Countries (LDCs). In many cases, international data sets make use of estimations alongside such real data as are gathered. For this reason, national data, where available, should normally be preferred to international data sets, provided that they have been gathered in accordance with international statistical norms and standards. It should be borne in mind that the definitions of certain terms in national data processes – for example, ‘broadband’ – may differ between countries.

Extensive data which are relevant to many aspects of the framework are gathered and retained by private sector companies, particularly network operators and online service providers. The volume of data which they hold comfortably exceeds that available to governments, and these data are analysed extensively by them in support of their own business models. Anonymised data derived from their data sets, subject to appropriate data protection regulations, could greatly help to illuminate our understanding of the Internet and support appropriate policy development. It would be valuable to all parties if private businesses were to make more data available to support public policy development.

Where quantitative data are available, it should be noted that these also rapidly become outdated because of the pace of change in Internet markets – both in the number of people making use of Internet, and in the technologies and services in use. There is also a risk that statistical measurements will overestimate the behaviour of those groups within society which make more use of Internet, or that they will place undue

weight on what is statistically measurable at the expense of that which is less quantifiable. Judgement needs to be exercised by those undertaking an assessment.

Qualitative evidence is an essential complement to quantitative evidence, and is particularly important in the many areas where no quantitative sources are available or likely to become so. As with quantitative evidence, those using the framework need to ensure that the qualitative 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. They should arrive at their conclusions transparently and objectively, with a supporting narrative that explains how they have done so.

The data deficiencies and challenges described above are experienced by all concerned with monitoring and measuring aspects of the Information Society. One of the advantages of a wide-ranging indicator framework, such as that developed for this report, is that it can address these challenges in different and interconnected ways. It is hoped that experience with this indicator framework will facilitate fresh thinking within the international community and national statistical systems concerning data-gathering and analysis about the Information Society.

Criteria for indicator selection

Six main criteria have been used for the selection of the questions and indicators that are proposed in this report. These are consistent with those adopted in the MDIs. They are:

- that each question/indicator 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 gender, age group, locality² 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.

The United Nations Development Programme's *Guide to Measuring the Impact of Right to Information Programmes* outlines a number of considerations for making indicators gender-sensitive and pro-poor, which are relevant in the context of these indicators.¹⁹ It notes that:

- Formal equality of women and men before the law may conceal differences in the lived experience of women and men.
- Information systems geared to traditionally defined citizenship rights may exclude women, especially in societies where women's access to the public sphere is restricted.
- Women's voices must be integrated from the start of developing a system of monitoring and evaluation.
- Similar considerations apply to making indicators pro-poor: much attention needs to be focused on how the poor access information, especially in rural areas where communication systems may be inoperative and illiteracy levels are high.

Two other considerations have been borne in mind when selecting indicators.

The first concerns the need for consistency between this indicator framework and others that address aspects of the Internet and its impact on development. Existing international standard indicators and indices have been adopted where these are appropriate, and are included as means of verification in the final indicator framework. As well as consistency, this helps to root these indicators in wider international efforts to monitor and measure outcomes of the Information Society.

² e.g. the distinction between rural and urban areas.

This is particularly important in the context of the Sustainable Development Goals (SDGs) which form part of the UN's *2030 Agenda for Sustainable Development*. Work to develop ICT indicators for the SDGs is being led by the UN Department for Economic and Social Affairs. The final indicator framework for Internet Universality will seek to ensure consistency with the outcome of this work.

The second additional consideration concerns the changing nature of the Internet and national Internet environments. The indicators which are selected should enable users to assess trends in Internet development as well as the position at a fixed point in time. Measuring change over time in this way, where possible, will be an important part of any indicator assessment. Longitudinal data sets which allow comparison with previous years are therefore desirable where they are available. At the same time, it should be noted that the value and impact of particular aspects of the Internet will vary over time as a result of changes in technology, pervasiveness and capabilities. As a result, findings from different years and environments which may seem superficially similar need to be interpreted carefully in light of different contexts.

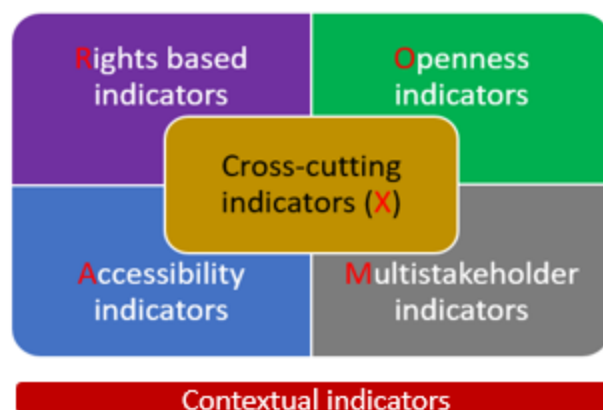
Lastly, it should be noted that the indicator framework is concerned with national Internet environments, and with issues that are susceptible to national policy and practice, not with international decision-making processes that are concerned with the Internet or with the roles and responsibilities of international Internet businesses. Some frameworks for assessing the performance of private businesses have been developed and may be useful to researchers.²⁰

THE INDICATOR FRAMEWORK

The indicator framework which is proposed in this document is structured around the four ROAM Principles, alongside Cross-Cutting Indicators concerned with gender and the needs of children and young people, sustainable development, trust and security, and legal and ethical aspects of the Internet. Together, these form the ROAMX indicator framework which is illustrated in Figure 2 below.

In addition, the framework includes 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 and frame their recommendations in the most appropriate way for different countries.

Figure 2 - The indicator structure

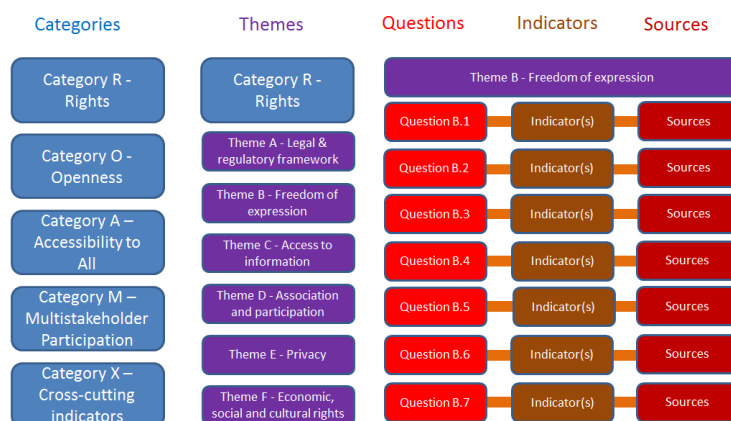


The indicators which are included in the framework provide a research toolkit which can be used by diverse stakeholders, including governments, international organisations, civil society organisations, research institutes and multistakeholder groups drawn from the various communities that are concerned with Internet development, access and rights. It can be used either holistically or through its component parts. Taken as a whole, it will build a collage of quantitative and qualitative measures that will allow the development of a comprehensive understanding of the Internet environment from the perspective of UNESCO's ROAM principles. Selections from it can also be used to undertake more limited assessments, for example in one or other of the four ROAM categories (in which case attention should also be paid to the cross-cutting indicators).

A short version of the framework has also been prepared for use when insufficient resources are available to undertake assessment of the full indicator framework (see Chapter 8).

The organising framework for the indicators is illustrated in Figure 3.

Figure 3 - The indicator structure



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 sought through quantitative, qualitative or institutional indicators.

Indicators. One or more indicators is/are identified for each question. These indicators provide the evidence base for assessment of the question. They include quantitative, qualitative and institutional indicators. The range and quality of information available on these will vary between countries.

Sources. Chapter 10 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 those making use of the indicators, recognising that available data and information sources vary significantly between countries.

Three other factors which are important for assessing indicators have been taken into account in developing the indicators.

- It is both important and valuable to understand differences between different groups within a population, and so to disaggregate data, where possible, according to characteristics including gender, age group and location.
- It is important to consider the timeliness of data (whether recent data are available).
- It is also valuable to understand how developments are changing within each category and theme, and so to take advantage of longitudinal data sets that cover several years or iterations of data-gathering.

These points are covered further in the section concerning methodology below.

UNESCO has drawn extensively on contributions and suggestions made during the consultation process in selecting the questions and indicators which have been included in the framework. As in the *Media Development Indicators*, the range and extent of these is greater and wider than in many comparable indicator frameworks. This allows for a collage of evidence to be built up in contexts which are relatively weak in terms of data availability as well as those that are relatively rich in data. To be viable, however, because of the limited resources which will be available for assessments, an indicator framework must be selective rather than comprehensive. It is not possible to include every question or every indicator that, in perfect

circumstances, might be considered useful. Examples have therefore been used as effective proxies for wider ranges of potential data to keep within the bounds of feasibility.³

An indicator framework also has to accommodate contextual differences between countries, which can only be reliably assessed by those undertaking an assessment. Too much precision in defining indicators within the framework can be detrimental to this, locking researchers into definitions or interpretations that are inappropriate (for example because they are derived from the experience of developed countries). The questions and indicators in the framework have therefore deliberately been phrased so that researchers use them in ways that are adaptable and relevant to national circumstances. For similar reasons, questions and indicators have been phrased, wherever possible, in ways that are not time-limited but adaptable to changing technology and markets.

FUTURE DEVELOPMENT OF THE INDICATORS

The Internet is changing very fast. Twenty years ago, Internet access was limited and the range of services available was very much less 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, while video streaming and cloud computing lay in the future. Today, the Internet is changing just as rapidly, as part of a wider range of changes in information technology including the Internet of Things, big data analysis, algorithmic decision-making, virtual reality, artificial intelligence and advanced robotics. The evolution of these technologies is very difficult to predict. As a result, the content and specific questions and indicators in this framework will need to be reviewed and revised regularly if they are to remain appropriate and relevant, and to cover the range of issues that mater in changing Internet environments.

Four issues are particularly important here.

First, some issues will become less significant and others more significant over time. The relative deployment of IPv4 and IPv6, for example, will become less significant as IPv6 becomes more universal.

Second, some issues will require changes in value or definition. The meaning of ‘broadband’, for example, will change with the levels of bandwidth which are generally available. It is still defined in some data sets, for example, as any data transfer rate above 256kbps, though this would not be capable of delivering many of the services which are now standard online.

Third, the range and quality of available indicators will change over time. The data challenges which currently affect assessments of Internet Universality are discussed above. It is hoped that there will be improvements in data availability, and thereby in sources and means of verification. These should be incorporated in the indicator framework in the future. New indices are also likely to be prepared by various stakeholders which may appropriately be included.

Fourth, major developments in technology and markets which are now emerging or will emerge in future will become more significant to the ROAM principles, requiring more attention to be paid to them. This will almost certainly be the case, for example, during the next five years with the Internet of Things. At present, few indicators are available to address these emerging issues, but relevant indicators are likely to become available. The present framework includes only a brief assessment of policy framework concerning them.⁴ This should be supplemented with more substantive quantitative and qualitative questions and indicators as the latter become available.

For these reasons, UNESCO hopes to review and, where appropriate, revise the indicator framework, questions and indicators, five years after their adoption and at five year intervals thereafter.

³ For example, three particular international organisations – the IGF, ICANN and ITU – have been selected for assessment of international multistakeholder governance, out of the very large range of international initiatives now underway, because these diverse organisations can stand as effective proxies for a wider range of organisations, and because data on these will be more generally available than for alternatives.

⁴ Category X Question C.1.

It is hoped that three developments over the next few years will facilitate assessments.

- The limited capacity of many national statistical systems restricts their ability to gather and analyse data on a regular basis, particularly in new and rapidly changing areas such as many of those in this framework. Financial and technical assistance will be required to support national statistical systems, particularly in Least Developed Countries (LDCs) and Small Island Developing States (SIDS), in integrating aspects of this framework into their regular data-gathering work
- Comprehensive surveys of patterns of public behaviour, including adoption and usage of the Internet, cannot be undertaken frequently even in high-income countries. Household surveys which are conducted to high professional and statistical standards add considerable value to the data sets available. More resources towards such surveys (and the inculcation of high standards in their deployment) would facilitate better understanding of many issues and questions in the framework.
- Private sector businesses have access to data which could also greatly facilitate that understanding, at both aggregate and disaggregated levels (for example, concerning the experience of women and of differences between urban and rural areas). Greater sharing of such data with policymakers and other stakeholders concerned with policy development, with appropriate protections for data privacy, would be beneficial.

UNESCO looks forward to working with other stakeholders to facilitate these three improvements.

METHODOLOGY FOR USE OF THE INDICATOR FRAMEWORK

This indicator framework is intended to assist governments and other stakeholders to investigate their national Internet environments, assess ways in which they could be improved in respect of the ROAM principles, and develop appropriate policies and practices to enable such improvements.

It is intended for use within individual countries, not to compare countries with one another. While the ROAM principles and many other aspects of the Internet are universal in character, different countries have different economic, social, legal and other dimensions which are relevant to Internet development at national level. Assessment of the questions and indicators in this framework needs to pay attention to these contextual factors.

Where relevant indices are available, however, it will be very useful to compare an individual country's experience with that in other countries with similar characteristics (*e.g.* other countries within its region, or other LDCs or SIDS), particularly where it is possible to compare trends between one country and another in order to see whether the country being assessed is underperforming or outperforming peers. A number of such indices are therefore included in the contextual indicators in Chapter 3 and identified for particular categories and themes in the Sources and Means of Verification in Chapter 10.

The indicator framework is intended as a research tool which can be used by a variety of different stakeholders, either individually or in collaboration. UNESCO believes that approaches which involve diverse stakeholders in data-gathering and assessment will benefit from diversity of expertise and perspectives.

The framework is intended to provide a basis for assessing the ROAM principles as a whole, including the cross-cutting indicators identified in Category X, and the interlinkages between these. This broad framework is comparable with that in UNESCO's *Media Development Indicators* and can be used, where appropriate, in conjunction with these. As discussed above, it is not intended to cover every aspect of the Internet, but to focus the attention of policymakers and practitioners on those dimensions of it which are particularly concerned with Internet Universality.

Different stakeholders will take different approaches to assessments which are appropriate to their contexts, capacities and available resources. The combination of quantitative, qualitative and other indicators in the framework is intended to help researchers to build up a collage of evidence which will enable them to draw well-informed conclusions and make appropriate proposals concerning policy and practice.

While UNESCO hopes that comprehensive assessments will be made using the entire indicator framework, it is clear that some potential users will experience resource constraints or wish to make more limited assessments. This document therefore also includes a short set of indicators which may be helpful when insufficient resources are available to make a full assessment. This can be found in Chapter 9.

Categories, themes, questions and indicators have also been designed to facilitate assessments of individual categories and themes as required. Where more limited assessments are undertaken, particular attention should be paid to including relevant issues from themes within the X category, particularly those concerned with gender.

Experience with the Media Development Indicators 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. Such teams can work collaboratively in a relatively short space of time, using a variety of sources and approaches, including:

- desk-based research into published and online reports, official statistics, independent surveys and written assessments made by academics, research institutes and other credible and authoritative sources;
- requests for information to government departments, private companies and other sources;
- individual discussions with key informants from government departments, private companies and other sources (including academics and other relevant experts);
- focus groups on particular aspects of the framework; and
- group discussion within the assessment team itself, drawing on its members' diverse experience and perspectives.

Researchers will need to consider carefully the quality and credibility of information available to them – for example, the timeliness of official statistics, the quality of household surveys, and the experience, interests and perspectives of authors of published assessments and discussants.

Sources and means of verification for each theme within the indicator framework are referenced in the framework itself and summarised in Chapter 9. The inclusion of a source or means of verification in this framework does not imply UNESCO's endorsement of the methodology or conclusions, but recognises that it can make a valuable contribution to the collage of available evidence.

UNESCO anticipates that this indicator framework will be used by a variety of different assessment teams with different levels of available resources and expertise. Each assessment team will therefore develop its own methodologies and approaches to the framework. The following points are intended to draw attention to issues of particular significance in data-gathering and analysis which should be borne in mind when assessments are prepared and undertaken.

1. Data may be derived from both national and international sources. In either case, it will be necessary to assess the quality and representativeness of data-gathering. Subject to this and to the timeliness of data (see below), it will usually be preferable to use national data directly rather than data reported in international data sets or indices. The range and timeliness of official statistics will, however, vary greatly between countries and will need to be borne in mind.
2. As a result of deficiencies in actual national data, some of the country data included in international data sets are derived from estimates based on earlier years within the country concerned or in some cases from data for comparable countries rather than data gathered in the country concerned. This is more likely to be the case in LDCs and in Small Island Developing States (SIDS). Where possible, the status and source of international comparative data in respect of individual countries should be checked with international agencies responsible for their publication.
3. Data may be derived from published and unpublished, offline and online, and public and private, sources. It will usually be easiest to begin research with published online sources, but unpublished information should also be sought from government departments and statistical agencies, commercial businesses

(such as network operators) and civil society sources to supplement and complement these. Household and similar surveys, where they are conducted to high professional standards, add extensively to the range and timeliness of data available, and can be particularly valuable in understanding perceptions of the Internet within society, for example concerning barriers to access or children's use of Internet.

4. Researchers should carefully assess the credibility and authoritativeness of the sources and evidence, both quantitative and qualitative, which they are using, including the quality of the methodology which has been used, the quality of analysis which has been applied, and the commercial, political or other interests represented by those undertaking investigations or publishing evidence.
5. Where possible, aggregate data should be disaggregated in order to enable assessment of the experience of different population groups. This is particularly important when considering impacts on and/or requirements by gender, age group (including children and young people), location (for example urban *versus* rural connectivity), ethnicity and disability. Household and similar surveys often have greater granularity in this respect than official statistics. Attention should also be paid to intersectionality, *i.e.* to the relationship between multiple factors (*e.g.* gender plus ethnicity plus income) in influencing outcomes.
6. Particular attention should be paid to the timeliness of data, which should be as close as possible to the date of the assessment. Quantitative data concerning access and usage of the Internet which are more than three years old, for example, are likely to be of limited value because of the rapid pace of developments in communications markets. 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.
7. The gathering and assessment of qualitative data pose distinct challenges to those for quantitative data. A variety of local and international assessments of qualitative issues is likely to be available, including official documents, the news media, and reports by national and international civil society organisations. These can be supplemented through individual discussions with informants and through focus groups. As with all research, quantitative as well as qualitative, researchers will need to assess and take into account the credibility, reliability and authoritativeness of these diverse sources.
8. Some indicators, both quantitative and qualitative, are concerned with understanding the attitudes or perceptions of Internet users, non-users and other stakeholder groups. The inclusion of users' experience in policy development has long been considered an essential part of ensuring effective policy development. Evidence concerning attitudes or perceptions is particularly important, for example, in 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. It is 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. It forms an important part of the overall collage of evidence required for policy development.
9. While the indicator framework is intended to provide a snapshot of experience at the time of an assessment, trends in rights, openness, accessibility, multistakeholder participation and cross-cutting indicators are as important to understanding what is happening as the situation at a particular moment in time. 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. This gives particular value to longitudinal evidence.
10. Likewise, while the indicator framework is concerned with national Internet environments, comparison with other countries – particularly those with similar geographical or economic characteristics – is helpful in assessing national experience. International data sets and indices are important for this purpose. For example, it is useful to compare a country's access and usage data with those from countries with

comparable GNI *per capita* to see whether it is outperforming or underperforming against these. Similarly, data concerning gender can be compared with performance in the overall Gender Inequality Index compiled by UNDP. The contextual indices identified in Chapter 3 have been included in the framework to facilitate these comparisons, while others can be made using indicators cited in Chapter 10.

11. The balance of significance between different questions and indicators within the framework, and within each category and theme, may vary between different countries (and with the focus of different assessments). It can also prove challenging to balance assessment of quantitative and qualitative indicators. One approach which some researchers find helpful is to assign a value (usually between one and five or one and ten) to performance against each indicator. (This is called a Likert scale.) This can be applied to both quantitative and qualitative indicators and can be particularly helpful in facilitating discussion with an investigation team. It is, however, only one among many approaches that can be taken to assessment.
12. In addition to this guidance, certain ethical considerations are important when gathering data for verifying indicators. The collection, processing, and dissemination of any statistical information have implications for the right to information, the right to privacy, data protection and confidentiality. Care should be taken to ensure that data used within investigations comply with appropriate ethical requirements.

A short selection of resources to assist in the methodology of data-gathering and analysis, including the ethical dimension in point 12, has been included at the start of Chapter 10.

CHAPTER 3 – 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 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 Least Developed Country (LDC) status.²¹

A. **Gross National Income (GNI) (purchasing power parity) *per capita***

The principal source for this indicator is the data set on GNI *p.c.* maintained by the World Bank.²²

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.²³

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.²⁴

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.⁵ 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

⁵ It is also one component of the Human Development Index, contextual indicator 3A.

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.²⁵

B. Average life expectancy at birth, disaggregated by gender

The principal source for this indicator is the data set concerning life expectancy at birth maintained by the World Health Organisation (WHO).²⁶ Data on life expectancy at birth are also included in the Human Development Index (HDI).²⁷

C. Proportions of 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.²⁸

D. Linguistic diversity

The principal source for this indicator is the index of linguistic diversity (with country summaries) maintained by Ethnologue.²⁹

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.³⁰

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.³¹ 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*.³²

B. Mean years of schooling and proportions of appropriate age groups in primary, secondary and tertiary education, disaggregated by gender

The principal source for this indicator consists of data sets which are gathered by the UNESCO Institute for Statistics.³³ Data on mean years of schooling are also included in the HDI.³⁴

C. Adult literacy rate, disaggregated by gender (and language where appropriate)

The principal source for this indicator consists of data gathered by the World Bank.³⁵

D. Proportion of population covered by electricity supply

The principal sources for this indicator is the World Bank's Sustainable Energy for All database.³⁶

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.³⁷

B. Gender Inequality Index

The principal source for this indicator is the Gender Inequality Index generated by the UN Development Programme.³⁸

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 B (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.³⁹

B. Rule of Law Index

The principal source for this indicator is the Rule of Law Index developed by the World Justice Project.⁴⁰

C. Doing Business Index

The principal source for this indicator is the Doing Business Index prepared by the World Bank.⁴¹

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).⁴² (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.⁴³ (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.⁴⁴ (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.⁴⁵

CHAPTER 4 – THE INTERNET UNIVERSALITY INDICATORS – CATEGORY R – RIGHTS

INTRODUCTION

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.'⁴⁶ 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)⁴⁷ and international rights agreements including the International Covenants on Civil and Political Rights (ICCPR)⁴⁸ and on Economic Social and Cultural Rights (ICESCR),⁴⁹ the Conventions on the Elimination of All Forms of Racial Discrimination (ICERD)⁵⁰ and of Discrimination against Women (CEDAW),⁵¹ and the Convention on the Rights of the Child (CRC).⁵² The UN Human Rights Council (HRC)⁵³ and the General Assembly⁵⁴ 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.

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 and young people. 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,⁵⁵ the African Charter on Human and Peoples Rights,⁵⁶ and the European Convention for the Protection of Human Rights and Fundamental Freedoms.⁵⁷ 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.

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)⁵⁸ and international rights agreements including the International Covenants on Civil and Political Rights (ICCPR)⁵⁹ and on Economic Social and Cultural Rights (ICESCR),⁶⁰ the Conventions on the Elimination of All Forms of Racial Discrimination (ICERD)⁶¹ and of Discrimination against Women (CEDAW),⁶² and the Convention on the Rights of the Child (CRC).⁶³ A number of regional rights agreements have also been agreed.

The UN Human Rights Council⁶⁴ and the General Assembly⁶⁵ 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.⁶⁶

Questions and indicators

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

A.3 Is there a legal framework to protect individuals against violations of rights using computers and the Internet?

Indicator:

- Existence of a legal framework and appropriate procedural powers concerned with protection against cybercrime which is consistent with international and regional rights agreements, laws and standards

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

Indicator:

- 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.'⁶⁷ 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.'⁶⁸ 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.⁶⁹ 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.⁷⁰ 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 B Theme D are also relevant to this theme.

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 authorities⁷¹
- Constitutional or legal guarantee of press/media freedom consistent with ICCPR Article 19
- Assessment 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* censorship of online content undertaken, on what grounds and with what transparency?

Indicator:

- 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, including social media?

Indicator:

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

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

Indicators:

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

B.7 Are individuals, journalists or other media/online actors subject to arbitrary detention, prosecution or intimidation for disseminating information online on political, religious or social issues?

Indicators:

- Existence and nature of relevant legal provisions and practice
- Evidence concerning the extent and nature of arbitrary detentions and prosecutions for online expression

B.8 Do individuals, journalists or other media/online actors practice self-censorship in order to avoid harassment by government or abuse by 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/young people

THEME C – RIGHT TO INFORMATION

The right 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.’⁷² Article 19(3) of the ICCPR (see above) and related provisions in other international and regional rights agreements also address access to information. 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.⁷³

This should be distinguished from legislation 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. 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 B Theme D are also relevant to this theme.

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

Indicators:

- Constitutional or legal guarantee 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 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 Internet shutdowns (if any)
- Numbers and trend of content access restrictions, takedowns of domain names and other interventions during the past three years

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

Indicator:

- Diversity of newspapers and online 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, particularly on political, religious or social issues?

Indicators:

- Scope and nature of legal provisions and practice
- Numbers of arbitrary detentions and prosecutions for access to content that is not prohibited by international agreement⁷

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

⁷ The latter include ‘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).

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. Both state that no restrictions may be placed on these 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.’ As with freedom of expression, the Human Rights Council has asserted the importance of legal frameworks, proportionality and independent oversight of any such restrictions.

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 civil society organisations organise freely online?

Indicator:

- Evidence of online organisation by civil society, 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 e-government services available through websites and apps
- Number of users of e-government services (disaggregated by gender 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 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 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.⁷⁴

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?

Indicator:

- 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 by data protection authority or equivalent entity

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?

Indicator:

- 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?⁷⁵

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?⁷⁶

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*.⁷⁷ 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.⁷⁸ 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?

Indicator:

- 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 activity?

Indicator:

- 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.

CHAPTER 5 – THE INTERNET UNIVERSALITY INDICATORS – CATEGORY O – OPENNESS

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 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.

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. Much innovation arises from the free flow of ideas and information, illustrating the interdependence between the rights-based and openness categories of Internet universality.

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. Attention should also be paid to Theme D in Category X when assessing this category.

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 affordable, 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?

Indicators:

- Existence of an overall framework consistent with relevant international norms⁷⁹
- 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
- Perceptions of experience of the regulatory environment for business and ICTs by businesses, including Internet-enabled business

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

Indicator:

- 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, transparency, balance and openness to participation by all interested parties?

Indicator:

- 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)?

Indicator:

- 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?

- 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?

Indicator:

- Data concerning the extent of IPv4 and IPv6⁹ deployment
- Data concerning the extent of DNSSEC¹⁰ deployment
- Evidence concerning adoption of current international cybersecurity standards and best practices

⁹ Internet Protocol versions 4 and 6

¹⁰ Domain Name System Security Extensions

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).

Cooperation between competing services is also necessary to maximise the value of communications networks, for example through technical interoperability. Question 6 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?

Indicator:

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

Indicator:

- 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 in-country (for both ccTLDs and gTLDs) and distribution of market shares
- Number of ISPs and distribution of market shares
- 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?

- Legal framework for establishment of community networks

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

Indicator:

- Existence and effective management of IXP(s)
- Proportion of domestic traffic using IXPs, including trend
- Latency levels 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.

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

Indicator:

- 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?

Indicator:

- Nature of legal arrangements for copyright enforcement, including arrangements for access to and fair use of copyright material
- 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?

Indicator:

- 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

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?

Indicator:

- Existence of a legal framework for access to open data which is consistent with international norms⁸⁰ 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 departments with websites (value/ranking in UNDESA online services index)
- Quality of government websites (extent of language availability, quantity of content, availability of mobile version)
- Proportion of adults who have used e-government services within twelve months, aggregate and disaggregated

E.3 Do government and other public stakeholders provide easy online access to anonymised publicly-held data sets,¹¹ including machine-readable access to original data?

Indicator:

- 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
- Availability of public access facilities that can be used for open data access in e.g. educational institutions and libraries
- 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

¹¹ Public data, as understood here, should not include personal data.

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

Indicator:

- 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)

CHAPTER 6 – THE INTERNET UNIVERSALITY INDICATORS – 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.⁸¹ 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.⁸²

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. Assessments should pay particular attention to the accessibility of the Internet for women, children and young people, relating findings concerning these to themes concerned with them in Category X.

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.

Questions 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 rights to 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?

Indicator:

- 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.2 Is there a legal right to 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?

Indicator:

- 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

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

Indicator:

- Adoption of a universal access strategy and evidence of effective deployment of UA resources
- Statistical evidence of progress towards universal access, aggregate and disaggregated
- *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?

Indicator:

- Inclusion of public access in universal access strategy
- Numbers of telecentres, libraries and other public facilities offering 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 Are broadband networks available in all districts of the country?¹²

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/bandwidth¹³ (and compared with proportion covered by mobile cellular signal) and by district
- International Internet bandwidth per Internet user⁸³
- Domestic Internet bandwidth per Internet user, disaggregated by district
- Download speeds for mobile Internet traffic

B.2 What proportion of the population subscribes to communications/broadband services, and is this growing?

Indicators:

- Percentage of individuals who own a mobile phone, aggregate and disaggregated⁸⁴
- Number of fixed broadband subscriptions per hundred population, aggregate and disaggregated⁸⁵
- Number of unique active mobile broadband subscribers per hundred population, by bandwidth, aggregate and disaggregated⁸⁶
- Number of IP addresses within the country, per hundred population

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

Indicators:

- Proportion of individuals who have ever accessed the Internet, aggregate and disaggregated
- Proportion of households with Internet access⁸⁷
- Number of Internet users per hundred population, aggregate and disaggregated, by frequency of use⁸⁸
- Number of social media (social networks, microblogs, user-generated video streaming)¹⁴ users per hundred population, aggregate and disaggregated
- Number of visits to social media websites (defined as above) 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, from household and other surveys

¹² 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 256kpbs and above, while others apply floors as high as 10Mbps. It is therefore important to consider the different tiers of bandwidth available where possible.

¹³ *i.e.* 2G, 3G, 4G *etc.*

¹⁴ It should be noted that the incidence of social media platforms varies between countries.

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

Indicator:

- Volume of fixed broadband Internet traffic in exabytes (including and excluding video streaming), per individual, per Internet user, and trend⁸⁹
- Volume of mobile broadband Internet traffic in exabytes (including and excluding video streaming), per individual, per Internet user, and trend⁹⁰

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),⁹¹ the Broadband Commission for Digital Development⁹² and the Alliance for Affordable Internet.⁹³

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?¹⁵

Indicator:

- Cost of a) entry-level⁹⁴ 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 broadband⁹⁵ access and use affordable to all sections of the population?¹⁶

Indicators:

- Cost of entry-level⁹⁶ fixed broadband connection and use as a percentage of monthly GNI *p.c.*
- Cost of entry-level⁹⁷ 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 practice⁹⁸
- Availability of price packages appropriate for groups with low or variable incomes

¹⁵ See endnote. Assessments should note different definitions of ‘entry level’ between countries and over time

¹⁶ 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 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 and Young People 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 in urban and rural areas, by level of bandwidth
- Numbers of mobile broadband subscribers and of Internet users, in urban and rural areas and in different regions

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

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

D.3 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 gender, compared with gender gaps in income and educational attainment¹⁷
- Proportions of adult women and men with mobile broadband subscriptions disaggregated by gender, compared with gender gaps in income and educational attainment
- Survey data on patterns of Internet use, disaggregated by gender
- Perceptions of barriers to Internet access and use, and of values of Internet access and use, disaggregated by gender

D.4 Do adults in all age groups make use of the Internet to the same extent?

Indicator:

- Proportion of those aged 55 and over who are using the Internet, and frequency of use, compared with those aged 18-24 and 25-54
- Perceptions of barriers to Internet access and use, and of values of Internet access and use, disaggregated by gender

D.5 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

¹⁷ This enables comparison of the gender digital divide with structural inequalities between women and men.

- 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 values of Internet access and use

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 and is this number growing?

Indicator:

- Number of registered domains (including both ccTLDs and gTLDs) per thousand population
- Number of servers per million population

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,¹⁸ 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
- 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

¹⁸ 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.

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 digital literacy to achievement of this goal is widely recognised. This includes basic literacy (which is included in the contextual indicators earlier in this volume), media and information literacy, and technical competence at various levels for different purposes.

UNESCO has an established group of media and information literacy indicators,⁹⁹ which are partly incorporated in this theme and provide a valuable resource for in-depth investigation.

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 Internet, focused on effective and safe use, and are these curricula implemented in practice?

Indicator:

- Policy concerning school curricula, including media and information literacy as well as ICT training
- Evidence of appropriate educational curricula at primary, secondary and tertiary levels
- Proportion of teachers in primary and secondary schools with training in ICTs or ICT-facilitated education
- Proportion of schools with computer-assisted instruction
- 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 gender
- 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?

Indicators:

- Proportion of Internet users with particular Internet skills, by skill type, aggregate and disaggregated¹⁰⁰
- Proportion of the workforce using ICTs in the workplace, by skill type, aggregate and disaggregated
- Proportion of higher education students enrolled in STEM and ICT courses, compared with global averages

CHAPTER 7 – UNESCO INTERNET UNIVERSALITY INDICATORS – 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.’¹⁰¹

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.’¹⁰²

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.

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.’¹⁰³ 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 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 – 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 concerning openness and transparency?

Indicators:

- Existence of an overall framework consistent with relevant international norms¹⁰⁴
- 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 O Theme A*

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

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) 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 gender

B.3 Is there a national Internet Governance Forum which is open to all stakeholders, with active participation from diverse stakeholder groups?

Indicator:

- Existence of national IGF
- Participation data, aggregate and disaggregated, 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
- Assessment of national IGF reports filed with global IGF Secretariat

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 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 and 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 gender
- Participation or otherwise of non-government stakeholders in official delegations to ITU, aggregated and disaggregated by stakeholder group and gender

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

Indicator:

- 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.

CHAPTER 8 – UNESCO INTERNET UNIVERSALITY INDICATORS – CROSS-CUTTING INDICATORS

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 and young people.
- 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 inequality 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 gender 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*,¹⁰⁵ 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.¹⁰⁶ Addressing the ‘gender digital divide’ was identified as a priority by the UN General Assembly in its ten-year review of WSIS outcomes in 2015.¹⁰⁷ 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.¹⁰⁸

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 and A.3 is concerned with the gender digital divide. (Question A.2 is also included in Theme D (Equitable Access) of Category A.) Questions A.4 to A.6 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?

Indicator:

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

A.3 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 gender

- Proportion of adults using mobile financial and online banking services, disaggregated by gender
- Proportion of adults using e-government services, disaggregated by gender
- Proportion of adults using electronic shopping services, disaggregated by gender

A.4 Do the law, law enforcement and judicial processes protect women and girls against online gender-based harassment and violence?

Indicators:

- 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

A.5 Is the proportion of women in STEM training, employment and Internet leadership significant and growing?

Indicators:

- Proportion of women in STEM courses in higher education
- Proportion of women in STEM employment, by level of skill
- Proportion of women in senior management positions in national Internet-related government departments/roles and Internet/communications businesses

A.6 Is accurate information about reproductive and sexual health freely available online?¹⁹

Indicator:

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

¹⁹ This is included as a sample area of content of particular relevance to women.

THEME B – CHILDREN AND YOUNG PEOPLE

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.’¹⁰⁹ 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, sexual predation, harassment and bullying. 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.

Young people, aged between 18 and 25, are among the most enthusiastic and intensive users of the Internet worldwide. The ITU estimates that 71% of those in this age group were online in 2017, compared with 48% of the global population.¹¹⁰

The interests of these two groups are distinct, but related because children’s experience of the Internet influences their subsequent adoption and use. Questions A.1 to A.3 are concerned with the experience of both children and young people. Questions A.4 to A.7 are concerned specifically with the experience of children, including government policy (A.4), education (A.5 and A.6), and child protection (A.6). An additional question concerning differences in Internet access and use by age group is included in Theme D (Equitable Access) of Category A.

The interests of children, in particular, need to 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.

Questions concerned with both children and young people

B.1 Does the government survey children and young people, consult them (and organisations concerned with children) about their use of the Internet?

Indicator:

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

B.2 What proportion of children aged between 5 and 18 and young people aged between 18 and 25 make use of the Internet?²⁰

Indicators:

- Proportions of children and young people making use of the Internet, compared with other countries and with other age groups, aggregate and disaggregated, including frequency of use

B.3 How do children and young people perceive and use the Internet?

Indicators:

- Perceptions of the Internet among children and young people derived from surveys, including barriers to use, value of use and fears concerning use, aggregate and disaggregated

²⁰ 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.’

- Data on use of the Internet by children and young people, aggregate and disaggregated, compared with other age groups (e.g. data on location of use, main type of use, frequency of use)

Questions concerned with children

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 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?

Indicator:

- Existence of government programmes to promote digital literacy and awareness of Internet safety 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

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).¹¹¹ 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.

A Task Group of the Partnership on Measuring ICT for Development is considering ICT Indicators for the SDGs within the timeframe for development of these Internet Universality indicators. The work of that Task Group will be taken into account during finalisation of this group of indicators.

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?

Indicator:

- 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 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 – defined here 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. 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. Alongside the threats to businesses and individuals posed by cybercrime, threats to critical infrastructure and databases 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, including a national computer emergency response team (CERT) or equivalent?

Indicators:

- Existence of cybersecurity strategy, with multistakeholder involvement, which is consistent with international practice
- 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 evidence on computer systems which is consistent with international and regional rights agreements, laws and standards?

Indicators:

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

D.3 Is there a legal and regulatory framework for consumer rights online?

Indicator:

- Existence of an established legal framework and evidence concerning compliance by businesses and implementation by government and other competent authorities

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

Indicator:

- Incidence of breaches, and numbers of individuals and businesses affected
- Perceptions of Internet security among users, businesses and other stakeholder groups
- Arrangements for and 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
- Proportion of servers which are secure servers
- 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 and social media to spread 'fake news', misrepresentations or distortions (including false documents and distorted images) and propaganda.¹¹² 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.7 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?

Indicators:

- 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 gender

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?

Indicator:

- 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 political activists)

E.5 Do Internet users in the country experience significant levels of cybercrime?

Indicators:

- Number of reports of Internet-enabled crime by category per thousand people, compared with other countries
- Number and trend of prosecutions for cybercrime

- Perceptions of the Internet and Internet content (in household surveys and opinion polling)

E.6 Is there adequate protection for e-commerce consumers?

Indicators:

- Legal framework for online consumer protection
- 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

E.7 Do individuals believe that the content of online sources of information is determined or manipulated by the government, foreign governments, commercial or partisan interests?

Indicator:

- 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

CHAPTER 9 – CORE INDICATORS

This chapter identifies a subset of indicators taken from the complete set in Chapters 4 to 8. This subset of indicators identifies core indicators which can be used to less comprehensive assessments of Internet Universality where resources are insufficient for a full assessment.

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

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* censorship of online content undertaken, on what grounds and with what transparency?

Indicator:

- 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

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

Indicators:

- Legal framework for blocking or filtering Internet access, including 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 Internet shutdowns (if any)
- Numbers and trend of content access restrictions, takedowns of domain names and other interventions during the past three years

D.2 Can civil society organisations organise freely online?

Indicator:

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

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?

Indicator:

- 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.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

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

Indicator:

- 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

CATEGORY O - OPENNESS

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?

Indicators:

- Existence of an overall framework consistent with relevant international norms¹¹³
- Existence of legal and regulatory frameworks to enable e-commerce, digital signatures, cybersecurity, data protection and consumer protection

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

- 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?

Indicator:

- 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
- 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 in-country (for both ccTLDs and gTLDs located) and distribution of market shares
- Number of ISPs and distribution of market shares

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 data, with appropriate privacy protections, and is that legislation implemented?

Indicator:

- Existence of a legal framework for access to open data which is consistent with international norms¹¹⁴ and privacy requirements
- Evidence concerning the extent to which open data resources are available and used online¹¹⁵

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?

Indicator:

- 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?

Indicator:

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

B.1 Are broadband networks available in all districts of the country?²¹

Indicator:

- Percentage of population covered by mobile broadband signal, disaggregated by available technology/bandwidth²² (and compared with proportion covered by mobile cellular signal) and by district

B.2 What proportion of the population subscribes to communications/broadband services, and is this growing?

²¹ 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 256kpbs and above, while others apply floors as high as 10Mbps. It is therefore important to consider the different tiers of bandwidth available where possible.

²² *i.e.* 2G, 3G, 4G *etc.*

Indicator:

- Number of unique active mobile broadband subscribers per hundred population, by bandwidth, aggregate and disaggregated

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

Indicator:

- Number of Internet users per hundred population, aggregate and disaggregated, by frequency of use

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

Indicator:

- Cost of a) entry-level mobile handset and b) smartphone as a percentage of monthly GNI *p.c.*
- Perceptions of affordability in household surveys, aggregate and disaggregated

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

Indicators:

- Cost of entry-level mobile broadband connection and use as a percentage of monthly GNI *p.c.*

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

Indicators:

- Geographical coverage in urban and rural areas, by level of bandwidth
- Numbers of mobile broadband subscribers and of Internet users, in urban and rural areas and in different regions

D.4 Do adults in all age groups make use of the Internet to the same extent?

Indicator:

- Proportion of those aged 55 and over who are using the Internet, and frequency of use, compared with those aged 18-24 and 25-54
- Perceptions of barriers to Internet access and use, and of values of Internet access and use, disaggregated by gender

D.5 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 values of Internet access and use

E.1 How many Internet domains and servers are there within the country and is this number growing?

Indicator:

- Number of registered domains (including both ccTLDs and gTLDs) per thousand population
- Number of servers per million population

E.4 Is there a substantial and growing volume of Internet content²³ 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 Internet, focused on effective and safe use, and are these curricula implemented in practice?

Indicator:

- Evidence of appropriate educational curricula at primary, secondary and tertiary levels

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

Indicators:

- Proportion of Internet users with particular Internet skills, by skill type, aggregate and disaggregated
- Proportion of the workforce using ICTs in the workplace, by skill type, aggregate and disaggregated
- Proportion of higher education students enrolled in STEM and ICT courses, compared with global averages

CATEGORY M – MULTISTAKEHOLDER PARTICIPATION

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) 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 gender

B.3 Is there a national Internet Governance Forum which is open to all stakeholders, with active participation from diverse stakeholder groups?

Indicator:

- Existence of national IGF
- Participation data, aggregate and disaggregated, 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

²³ This should include text, audio and video content.

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 gender
- Participation or otherwise of non-government stakeholders in official delegations to ITU, aggregated and disaggregated by stakeholder group and gender

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

Indicator:

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

A.4 Do the law, law enforcement and judicial processes protect women and girls against online gender-based harassment and violence?

Indicators:

- 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

B.2 What proportion of children aged between 5 and 18 and young people aged between 18 and 25 make use of the Internet?²⁴

Indicators:

- Proportions of children and young people making use of the Internet, compared with other countries and with other age groups, aggregate and disaggregated, including frequency of use

B.3 How do children and young people perceive and use the Internet?

Indicators:

- Perceptions of the Internet among children and young people 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 and young people, aggregate and disaggregated, compared with other age groups (e.g. data on location of use, main type of use, frequency of use)

²⁴ 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.'

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

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

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

Indicator:

- 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

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
- Volume of business-to-business and business-to-consumer activity as a proportion of total relevant activity
- Perceptions of value of Internet use by SMEs

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

Indicators:

- Existence of cybersecurity strategy, with multistakeholder involvement, which is consistent with international practice
- 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?

Indicator:

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

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?

Indicator:

- 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 political activists)

CHAPTER 10 - SOURCES AND MEANS OF VERIFICATION

Guidance concerning sources and means of verification can be found in Chapter 2 above. Sources for the contextual indicators listed in Chapter 3 are included in that chapter.

This chapter begins with a brief list of sources of guidance concerning research methodology and ethics. It then lists sources and means of verification which may be used in assessments of the indicators in each of the five ROAM Categories, following the structure of Themes within each Category as Chapters 4 to 7. 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.

Entries for each theme are set out in a table with three columns:

- Column A reiterates the questions and indicators included in the framework above.
- Column B identifies international agreements and other sources which define or elaborate the question or indicator concerned, or consider it in the light of international experience.
- Column C identifies sources and means of verification that may be useful for individual country assessments. This includes both specific sources (such as those derived from official statistics) and generic sources (such as household surveys or media reports) which will be variously available in different countries.

SOURCES CONCERNING RESEARCH METHODOLOGY

The indicator framework set out in this document covers a wide range of sources and methodologies, including quantitative and qualitative source 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 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.);¹¹⁶
- P. Alasuutari, L. Bickman, J. Brannan & J. Brannen (2008). *The SAGE Handbook of Social Research Methods*;¹¹⁷
- R. M. Groves, F. J. Fowler, M. P. Couper, J. M. Lepkowski, E. Singer & R. Tourangeau (2009). *Survey Methodology*;¹¹⁸
- UNHCHR (2012). *Human Rights Indicators: A Guide to Measurement and Implementation*.¹¹⁹

SOURCES FOR INDICATORS

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

CATEGORY R – RIGHTS

THEME A – POLICY, LEGAL AND REGULATORY FRAMEWORK

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)¹²⁰
- the International Covenant on Civil and Political Rights (ICCPR)¹²¹
- the International Covenant on Economic, Social and Cultural Rights (ICESCR)¹²²
- the Convention on the Elimination of All Forms of Racial Discrimination (ICERD)¹²³
- the Convention on the Elimination of Discrimination against Women (CEDAW)¹²⁴
- the Convention on the Rights of the Child (CRC)¹²⁵

The United Nations General Assembly has agreed that ‘the same rights that people have offline must also be protected online.’¹²⁶ 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*, 2016.¹²⁷

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

- the American Convention on Human Rights¹²⁸
- the African Charter on Human and Peoples’ Rights¹²⁹
- the Arab Charter on Human Rights¹³⁰
- the European Convention for the Protection of Human Rights and Fundamental Freedoms¹³¹

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

- *CONNECTing the Dots*, conference outcome document, 2015¹³²
- *Keystones to Foster Inclusive Knowledge Societies*, 2015¹³³
- *Renewing the Knowledge Societies Vision for Peace and Sustainable Development*, 2013¹³⁴

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)¹³⁵
- Freedom House, *Freedom on the Net*¹³⁶
- World Economic Forum, *Networked Readiness Index*, 2016 – e.g. environment sub-index¹³⁷

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 assessments¹³⁸
- Reporters Without Borders, *World Press Freedom Index*¹³⁹
- V-Dem Institute, *Varieties of Democracy* – e.g. the electoral democracy index and the expanded freedom of expression indicators¹⁴⁰
- World Economic Forum, *Networked Readiness Index*, – e.g. environment sub-index¹⁴¹

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)¹⁴²

- 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 other 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 Association¹⁴³
- International Bar Association reports on aspects related to the rule of law¹⁴⁴
- UNODC, *Cybercrime Repository* (database) – e.g. database of cybercrime legislation, lessons learned, case law database¹⁴⁵
- International Association of Prosecutors, *Global Prosecutors e-Crime Network* – training and database of best practices¹⁴⁶

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)¹⁴⁷
- 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 other 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*¹⁴⁸
- Article 19's repository of information on legal and policy developments of relevance to freedom of expression in individual countries¹⁴⁹ [ADD GLOBAL NETWORK INITIATIVE'S COUNTRY-BASED RESEARCH IN THIS AREA?]
- Open Technology Institute, *Ranking Digital Rights Corporate Accountability Index*¹⁵⁰
- Reporters Without Borders, *World Press Freedom Index*,¹⁵¹ e.g. indicators legislative framework
- *Varieties of Democracy* (V-Dem) (annual) – e.g. the electoral democracy index and the expanded freedom of expression indicators¹⁵²

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.¹⁵³

THEME C – RIGHT 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)¹⁵⁴
- 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 other 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)¹⁵⁵
- reports by national human rights committees and councils
- reports by civil society organisations
- media reports and academic studies
- information from other 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 survey index¹⁵⁶
- UN, *E-Participation Index*, 2015 – e.g. e-consultation and e-decision-making¹⁵⁷
- World Economic Forum, *Networked Readiness Index*, 2016 – e.g. environment sub-index and usage/government usage sub-index¹⁵⁸
- World Justice Project, *Open Government Index* – e.g. civic participation sub-section¹⁵⁹

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-section¹⁶⁰
- World Wide Web Foundation, *Open Data Barometer* (2016) – e.g. citizen and civil society sub-section¹⁶¹

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)¹⁶²
- 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 other 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*¹⁶³
- Council of Europe, *Internet Freedom* indicators (appendix to Recommendation CM/Rec (2016)5) – specifically subsection 4 on right to private and family life¹⁶⁴
- Freedom House, *Freedom on the Net* (annual) – specifically *violations of user rights* section – no 5 and 6¹⁶⁵
- Privacy International, *State of Privacy* briefings (annual) – e.g. data protection laws and accountability measures¹⁶⁶

- UNCTAD, *Global Cyberlaw Tracker* (interactive database), 2018 – see *Data Protection and Privacy Legislation Worldwide* section¹⁶⁷
- UN Special Rapporteur on Freedom of Expression, Frank la Rue & APC's *Monitoring Framework on Freedom of Expression Online*, 2013¹⁶⁸

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 other 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, 2005¹⁶⁹
- Convention for the Safeguarding of the Intangible Cultural Heritage, 2003¹⁷⁰
- Recommendation concerning the preservation of, and access to, documentary heritage including in digital form, 2015¹⁷¹
- Recommendation concerning the Promotion and Use of Multilingualism and Universal Access to Cyberspace, 2003¹⁷²
- UNESCO Charter on the Preservation of the Digital Heritage, 2003¹⁷³

The United Nations' Sustainable Development Goals are included in the *2030 Agenda for Sustainable Development*.¹⁷⁴ 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,¹⁷⁵ and is also a source of statistics on employment.¹⁷⁶

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.¹⁷⁷

The UNESCO Institute for Statistics compiles comparative data on educational experience in different countries.¹⁷⁸

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*¹⁷⁹

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

- Budapest Open Access Initiative¹⁸⁰
- SPARC, various resources¹⁸¹

The following UNESCO reports contain relevant information:

- *Privacy, Free Expression and Transparency*, 2016¹⁸²
- *Fostering Freedom Online: the Role of Internet Intermediaries*, 2014¹⁸³
- *Principles for governing the Internet: a comparative analysis*, 2013¹⁸⁴
- *Freedom of connection, freedom of expression: the changing legal and regulatory ecology shaping the Internet*, 2011¹⁸⁵

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 other 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*¹⁸⁶
- UNCTAD, *Global Cyberlaw Tracker*¹⁸⁷
- World Economic Forum, *Networked Readiness Index* – e.g. environment sub-index¹⁸⁸

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 other 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 map¹⁸⁹

- Carnegie Cyber Policy Initiative, *Cyber Norms Index*¹⁹⁰
- Internet Society, DNSSEC deployment maps¹⁹¹
- Internet Society, collection of IPv6 deployment data¹⁹²
- Network World, map of countries with open source laws¹⁹³
- Open Knowledge International, *Global Open Data Index*¹⁹⁴
- Open Stand, *The Modern Paradigm for Standards*¹⁹⁵
- OSS Watch (concerned with open source software)¹⁹⁶

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 other credible and authoritative informants, including Internet businesses

International documents and data sets concerned with open markets include:

- 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*¹⁹⁸
- World Economic Forum, *Global Competitiveness Index* – e.g. innovation and technological readiness sub-section¹⁹⁹

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 other 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, 1996²⁰⁰
- The Agreement on Trade-Related Aspects of Intellectual Property Rights, 1993²⁰¹
- The Berne Convention for the Protection of Literary and Artistic Works, 1886²⁰²

International documents and data sets concerned with open content include:

- Global Innovation Policy Centre, *Global IP Index*²⁰³
- Global Net Neutrality Coalition, *Status of Net Neutrality around the world*²⁰⁴

- Open Knowledge International, *Global Open Data Index*²⁰⁵
- SPARC, *OER State Policy Tracker*²⁰⁶ and *Open Access Spectrum Evaluation Tool*²⁰⁷
- UNESCO and Commonwealth of Learning, *A Basic Guide to Open Educational Resources*²⁰⁸

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*²⁰⁹ and *E-Participation Index*²¹⁰
- opinion surveys of users of open government services
- media reports and academic studies
- information from other 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 Mechanism²¹¹
- Open Knowledge International, *Global Open Data Index*²¹²
- Open Technology Institute, *Ranking Digital Rights Corporate Accountability Index*²¹³
- UN DESA, *E-Government Survey*²¹⁴ (particularly Online Service Index) and *E-Participation Index*²¹⁵
- Waseda University, *E-Government Index*²¹⁶
- World Justice Project, *Open Government Index*²¹⁷
- World Wide Web Foundation, *Open Data Barometer*²¹⁸

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.'²¹⁹ 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).²²⁰ The GSM Association researches and collates data on mobile and mobile Internet.²²¹ 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 other 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.²²² National broadband policies are listed by the Broadband Commission for Sustainable Development,²²³ which has published a series of reports on broadband policy development.²²⁴

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 other credible and authoritative informants

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

- Alliance for Affordable Internet, Affordability Index²²⁵
- Budde.comm, various indicators of relevance²²⁶
- CETIC.br, *ICT Households and Enterprises Index*²²⁷
- DIRSI, LIRNEasia and Research ICT Africa, *After Access* surveys²²⁸
- GSMA, *Mobile Connectivity Index*²²⁹
- Internet Governance Forum, reports on *Connecting and Enabling the Next Billion(s)*²³⁰
- ITU, *ICT Development Index*²³¹ and its access and usage sub-indices, analysed in annual *Measuring the Information Society* reports²³²

- OECD connectivity and usage indicators²³³
- Packet Clearing House, *Internet Exchange Directory*²³⁴
- World Economic Forum, *Networked Readiness Index*²³⁵
- World Wide Web Foundation, *Women's Rights Online: Digital Gender Audit and Digital Gender Scorecard*²³⁶

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 other credible and authoritative informants

International indicator frameworks and data sets concerned with affordability include:

- Alliance for Affordable Internet, *Affordability Index*²³⁷ and *Policy and Regulatory Good Practices*²³⁸
- DIRSI, LIRNEasia and Research ICT Africa, *After Access surveys*²³⁹
- Economist Intelligence Unit and Facebook, *Inclusive Internet Index*²⁴⁰
- Freedom House, *Freedom on the Net* – e.g. obstacles to access sub-section²⁴¹
- ITU, *Measuring the Information Society* reports²⁴²
- World Economic Forum, *Networked Readiness Index*²⁴³
- GSMA, *Mobile Connectivity Index*²⁴⁴

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 other credible and authoritative informants

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

- DIRSI, LIRNEasia and Research ICT Africa, *After Access surveys*²⁴⁵
- Economist Intelligence Unit and Facebook, *Inclusive Internet Index*²⁴⁶
- GSMA, GSMA Intelligence reports²⁴⁷ (requires registration)
- ITU, data sets in ICT Indicators database (some of which may require subscription)²⁴⁸
- UNESCO, *Opening New Avenues for Empowerment: ICTs to Access Information and Knowledge for Persons with Disabilities*, 2013²⁴⁹

- World Wide Web Foundation, *Women's Rights Online: Digital Gender Audit and Digital Gender Scorecard*²⁵⁰

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)²⁵¹ 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 other 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* surveys²⁵²
- 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)²⁵³
- Statistica, data on ccTLDs²⁵⁴
- GSMA, *Mobile Connectivity Index*²⁵⁵
- OECD, *Measuring Digital Local Content*²⁵⁶
- Packet Clearing House, *Internet Exchange Directory*²⁵⁷
- UNESCO, *Twelve years of measuring linguistic diversity in the Internet: balance and perspectives*²⁵⁸

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 concerned with
- 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 other 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.

Evidence concerning media and information literacy (F2) may be obtained from a variety of sources including UNESCO, *Global Media and Information Literacy Assessment Framework*²⁵⁹ and UNESCO, *Media and Information Literacy Policy and Guidelines*, 2013.²⁶⁰

CATEGORY M - MULTISTAKEHOLDER PARTICIPATION

GENERAL

The *Tunis Agenda for the Information Society*,²⁶¹ 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.²⁶²

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

- UN, *E-Participation Index*²⁶³
- World Justice Project, *Open Government Index* – e.g. publicised laws and right to information sub-sections²⁶⁴

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

- *Principles for governing the Internet: a comparative analysis*, 2013²⁶⁵
- *What if we all governed the Internet? The evolution of multistakeholder participation in Internet governance*, 2017²⁶⁶

Other documents and reports concerning multistakeholder Internet governance include

- APC, *GISwatch 2017 – National and Regional Internet Governance Forum Initiatives*²⁶⁷
- Global Commission on Internet Governance, *One Internet*²⁶⁸
- Global Partners Digital, *Framework for Multistakeholder Cyber Policy Development*²⁶⁹
- IGF, National and Regional IGFs registry²⁷⁰
- NETmundial Initiative, *NETmundial Internet Principles*²⁷¹
- World Justice Project, *Open Government Index*²⁷²

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 other 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
- national domain name registry
- media reports and academic studies
- information from other credible and authoritative informants

THEME B – INTERNATIONAL 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
- global and regional IGFs
- ICANN and ITU
- media reports and academic studies
- information from other 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.²⁷³ The rights of women are elaborated in the Convention on the Elimination of all forms of Discrimination against Women (CEDAW).²⁷⁴

Goal 5 of the UN Sustainable Development Goals is concerned with gender equity.²⁷⁵ 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
- information from other credible and authoritative informants
- evidence concerning skills and skills development from educational authorities, higher educational institutions
- workplace surveys and other evidence concerned with skills and capabilities
- information from other 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:

- Broadband Commission for Digital Development, *Doubling Digital Opportunities: Enhancing the Inclusion of Women and Girls in the Information Society*²⁷⁶
- Broadband Commission for Digital Development, *Recommendations for Action: bridging the digital gender gap in Internet and broadband access and use*²⁷⁷
- GSMA, *Mobile Gender Gap Report*²⁷⁸
- IGF Best Practice Forum on Gender, *Overcoming Barriers to Enable Women's Meaningful Internet Access*²⁷⁹
- ITU, *Women in ITU Meetings*²⁸⁰
- UNCTAD and ILO, *Empowering Women Entrepreneurs through ICT*²⁸¹
- UNESCO, *Cracking the Code: Girls' and Women's Education in Science, Technology, Engineering and Mathematics*²⁸²
- UNESCO, *Gender-Sensitive Indicators for Media*²⁸³
- UNESCO, *Mobile Phones and Literacy: Empowerment in Women's Hands*²⁸⁴
- World Wide Web Foundation, *Women's Rights Online: Digital Gender Audit and Digital Gender Scorecard*²⁸⁵

THEME B – CHILDREN AND YOUNG PEOPLE

This theme is concerned with both children and young people. However, the interests of these two groups are, in many ways, distinct, and require separate assessment. In particular, 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.²⁸⁶

Evidence for indicators concerned with both children and young people 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 other credible and authoritative informants

Evidence concerning children can additionally be sought from:

- 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*,²⁸⁷ 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*²⁸⁸
- UNESCO, *Survey on Privacy in Media and Information Literacy with Youth Perspectives*²⁸⁹
- UNICEF, *The State of the World's Children 2017 – Children in a Digital World, 2017*²⁹⁰
- UNICEF, *Child Online Safety Assessment Tool*²⁹¹
- UN Special Rapporteur on Freedom of Opinion and Expression, *Report on the right of the child to freedom of expression, 2014*²⁹²

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 update 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 other 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 publications²⁹³
- DIRSI, LIRNEasia and Research ICT Africa, *After Access* surveys²⁹⁴
- GSMA, *State of the Industry Report on Mobile Money*²⁹⁵
- Internet Society, *The Internet and Sustainable Development*²⁹⁶
- ITU and UNU, *Global E-Waste Monitor*²⁹⁷
- UN DESA, *E-Government Surveys*²⁹⁸
- UN DESA, *Advancing a Sustainable Information Society for All, 2015*²⁹⁹
- World Bank, *World Development Report 2016, Digital Dividends*³⁰⁰

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 other credible and authoritative informants

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

- Akamai, *State of the Internet index*³⁰¹
- Breach Level Index, *Data Breach Statistics*³⁰²
- Carnegie Cyber Policy Initiative, *Cyber Norms Index*³⁰³
- Europol, *Internet Organised Crime Threat Assessment*³⁰⁴
- Global Cybersecurity Capacity Centre, *Cybersecurity Capacity Maturity Model for Nations*³⁰⁵
- ITU, *Global Cybersecurity Index*³⁰⁶
- OECD, *Guidelines in Measuring Trust*³⁰⁷
- UNCTAD, *Global Cyberlaw Tracker*³⁰⁸
- UN Office on Drugs and Crime (UNODC), *Cybercrime Repository*³⁰⁹
- World Bank, *Combating Cybercrime Index*³¹⁰

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 other 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*³¹¹

- GSMA, *A framework to understand women's mobile-related safety concerns in low-and middle-income countries*³¹²
- IGF BPF, *Online Abuse and Gender-Based Violence Against Women*³¹³
- International Association of Prosecutors, *Global Prosecutors e-Crime Network* – training and database of best practices³¹⁴
- Open Technology Institute, *Ranking Digital Rights Corporate Accountability Index*³¹⁵
- Take Back The Tech!, *Mapping Technology-Related Violence Against Women*³¹⁶
- UNCTAD, *E-Commerce Index*³¹⁷
- UNCTAD, *Global Cyberlaw Tracker*³¹⁸
- UNESCO, *Countering Online Hate Speech*³¹⁹
- UN High Commissioner for Human Rights, *Annual Report 2013*³²⁰
- UNODC, *Cybercrime Repository*³²¹
- UNODC, *Cybercrime Repository* (database) – e.g. database of cybercrime legislation, lessons learned, case law database³²²
- World Bank, *Combating Cybercrime Index*³²³
- World Wide Web Foundation, *Women's Rights Online: Digital Gender Audit and Digital Gender Scorecard*³²⁴

¹ <http://www.unesco.org/new/en/communication-and-information/resources/publications-and-communication-materials/publications/full-list/media-development-indicators-a-framework-for-assessing-media-development/>

² <http://en.unesco.org/programme/ipdc>

³ See UNESCO, *Knowledge Societies Handbook*,

http://en.unesco.org/sites/default/files/knowledge_socities_policy_handbook.pdf

⁴ 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>

⁵ <http://www.unesco.org/new/en/communication-and-information/about-us/>

⁶ 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

⁷ <http://unesdoc.unesco.org/images/0023/002340/234090e.pdf>

⁸ <http://unesdoc.unesco.org/images/0023/002325/232563E.pdf>

⁹ <https://sustainabledevelopment.un.org/post2015/transformingourworld>

¹⁰ See <http://www.itu.int/en/ITU-D/Statistics/Pages/intlcoop/partnership/post2015.aspx>. The Partnership includes 14 United Nations and other international agencies.

¹¹ <http://unesdoc.unesco.org/images/0016/001631/163102e.pdf>

¹² 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/>

¹³

http://www.unesco.org/fileadmin/MULTIMEDIA/HQ/CI/CI/pdf/official_documents/Journalists_Safety_Indicators_National_Level.pdf

¹⁴ <http://unesdoc.unesco.org/images/0021/002178/217831e.pdf>

¹⁵

http://www.unesco.org/fileadmin/MULTIMEDIA/HQ/CI/CI/pdf/unesco_mil_indicators_background_document_2011_final_en.pdf

¹⁶

http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/CI/CI/pdf/IPDC/ipdc_29Final_Report_Council_Session_EN_with_RAPP_edits.pdf, para. 8.1.2.

¹⁷ <http://unesdoc.unesco.org/images/0023/002340/234090e.pdf>, para. 6.5

¹⁸ The project was coordinated for UNESCO by Guy Berger and Xianhong Hu with the assistance of Josselyn Guillarmou, and for the APC-led consortium by Anriette Esterhuysen. Research and indicator development was led by David Souter of *ict* Development Associates, and undertaken by David Souter and Anri van der Spuy in conjunction with UNESCO.

¹⁹

[file:///C:/Users/David%20N%20Souter/Downloads/A%20Guide%20to%20Measuring%20the%20Impact%20of%20Right%20to%20Information%20Programmes%20\(2\).pdf](file:///C:/Users/David%20N%20Souter/Downloads/A%20Guide%20to%20Measuring%20the%20Impact%20of%20Right%20to%20Information%20Programmes%20(2).pdf), Chapter 3.

²⁰ for example the Corporate Accountability Index of the Ranking Digital Rights project, <https://rankingdigitalrights.org/>

²¹ Lists of these countries can be found at <http://www.unohrlls.org/>

²² <https://data.worldbank.org/indicator/NY.GNP.PCAP.PP.CD>. It is also one component of the Human Development Index, contextual indicator 3A.

²³ *Ibid.*

²⁴ <https://data.worldbank.org/indicator/NV.SRV.TETC.ZS>

²⁵ <https://esa.un.org/unpd/wpp/Download/Standard/Population/>

²⁶ <http://apps.who.int/gho/data/node.main.688>

²⁷ <http://hdr.undp.org/en/composite/HDI>

²⁸ <https://esa.un.org/unpd/wpp/Download/Standard/Population/>.

²⁹ These data require a subscription, but may be available through subscriptions held by researchers' organisations, e.g. government departments and universities:

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- <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>
- ³⁰ <https://esa.un.org/unpd/wup/>
- ³¹ See successive ITU *Measuring the Information Society* reports, e.g. <http://www.itu.int/en/ITU-D/Statistics/Pages/publications/mis2016.aspx>
- ³² <http://hdr.undp.org/en/composite/HDI>
- ³³ <http://data.uis.unesco.org/Index.aspx?queryid=242>. Mean years of schooling is also included in the Human Development Index, contextual indicator 3A.
- ³⁴ <http://hdr.undp.org/en/composite/HDI>
- ³⁵ <https://data.worldbank.org/indicator/SE.ADT.LITR.ZS>
- ³⁶ <http://www.indexmundi.com/facts/indicators/EG.ELC.ACCS.ZS>
- ³⁷ <https://www.indexmundi.com/facts/indicators/SI.POV.GINI/rankings>
- ³⁸ <http://hdr.undp.org/en/content/gender-inequality-index-gii>
- ³⁹ <http://info.worldbank.org/governance/wgi/#home> and <http://info.worldbank.org/governance/wgi/#reports>
- ⁴⁰ <https://worldjusticeproject.org/our-work/wjp-rule-law-index>
- ⁴¹ <https://data.worldbank.org/data-catalog/doing-business-database>. Latest data at the time of publication are in World Bank, *Doing Business 2018*, <http://www.doingbusiness.org/~media/WBG/DoingBusiness/Documents/Annual-Reports/English/DB2018-Full-Report.pdf>
- ⁴² <http://www.itu.int/en/ITU-D/Statistics/Pages/publications/mis/methodology.aspx>.
- ⁴³ <https://www.gsma.com/mobilefordevelopment/programme/connected-society/mobile-connectivity-index/>
- ⁴⁴ <https://www.weforum.org/agenda/2016/07/what-is-networked-readiness-and-why-does-it-matter/>
- ⁴⁵ http://unctad.org/en/PublicationsLibrary/tn_unctad_ict4d09_en.pdf
- ⁴⁶ <https://sustainabledevelopment.un.org/post2015/transformingourworld>, para. 8
- ⁴⁷ http://www.un.org/en/udhrbook/pdf/udhr_booklet_en_web.pdf
- ⁴⁸ <http://www.ohchr.org/EN/ProfessionalInterest/Pages/CCPR.aspx>
- ⁴⁹ <http://www.ohchr.org/EN/ProfessionalInterest/Pages/CESCR.aspx>
- ⁵⁰ <http://www.ohchr.org/EN/ProfessionalInterest/Pages/CERD.aspx>
- ⁵¹ <http://www.un.org/womenwatch/daw/cedaw/>
- ⁵² <http://www.ohchr.org/EN/ProfessionalInterest/Pages/CRC.aspx>
- ⁵³ http://ap.ohchr.org/documents/E/HRC/d_res_dec/A_HRC_20_L13.doc
- ⁵⁴ <http://workspace.unpan.org/sites/Internet/Documents/UNPAN96078.pdf>, para. 43
- ⁵⁵ <https://www.cidh.oas.org/basicos/english/basic3.american%20convention.htm>
- ⁵⁶ <http://www.humanrights.se/wp-content/uploads/2012/01/African-Charter-on-Human-and-Peoples-Rights.pdf>
- ⁵⁷ http://www.echr.coe.int/Documents/Convention_ENG.pdf
- ⁵⁸ http://www.un.org/en/udhrbook/pdf/udhr_booklet_en_web.pdf
- ⁵⁹ <http://www.ohchr.org/EN/ProfessionalInterest/Pages/CCPR.aspx>
- ⁶⁰ <http://www.ohchr.org/EN/ProfessionalInterest/Pages/CESCR.aspx>
- ⁶¹ <http://www.ohchr.org/EN/ProfessionalInterest/Pages/CERD.aspx>
- ⁶² <http://www.un.org/womenwatch/daw/cedaw/>
- ⁶³ <http://www.ohchr.org/EN/ProfessionalInterest/Pages/CRC.aspx>
- ⁶⁴ http://ap.ohchr.org/documents/E/HRC/d_res_dec/A_HRC_20_L13.doc
- ⁶⁵ <http://workspace.unpan.org/sites/Internet/Documents/UNPAN96078.pdf>, para. 43
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- ⁸³ This indicator is included in the ITU ICT Development Index.
- ⁸⁴ 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).
- ⁸⁵ This indicator is included in the ITU ICT Development Index, with greater detail concerning bandwidth from 2018
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- ⁸⁷ This indicator is included in the ITU ICT Development Index
- ⁸⁸ This indicator is included, at aggregate level, in the ITU ICT Development Index
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- ⁹⁵ 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.
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- ¹⁰² <http://workspace.unpan.org/sites/Internet/Documents/UNPAN96078.pdf>, paragraph 3
- ¹⁰³ <https://sustainabledevelopment.un.org/post2015/transformingourworld>, paragraph 17.16
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