WSIS Forum 2019

WSIS Action Lines Contributing towards Empowering People and Ensuring Inclusiveness and Equality

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Introduction

Information and communications technologies (ICTs) are now integral to how we approach sustainable development. They enable innovative solutions to today's complex and interconnected challenges, helping in particular to empower people, ensuring inclusiveness and equality as envisioned in the 2030 Agenda.

Countries are increasingly looking to leverage ICTs to achieve the set of goals in review for HLPF 2019:

- Goal 4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all
- Goal 8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all
- Goal 10. Reduce inequality within and among countries
- Goal 13. Take urgent action to combat climate change and its impacts
- Goal 16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels
- Goal 17. Strengthen the means of implementation and revitalize the global partnership for sustainable development

This year's HLPF is opportune for facilitating global partnerships and connecting governments with partners and stakeholders on these shared priorities. In this regard, it is suggested that the expertise of UNGIS members as UN body for digital cooperation within the system is leveraged to achieve the SDGs.

Knowledge and information societies should be subject to universally held values, promote the common good and prevent abusive uses of ICTs. It takes steps to promote respect for peace and to uphold the fundamental values of freedom, equality, solidarity, tolerance, shared responsibility and respect for nature.

ICTs are now integral to how people in many parts of the world live and work, transforming societies and economies for good. Their potential to address complex and interconnected development challenges is also now widely recognized. The World Summit on the Information Society (WSIS) is a unique two-phase2 United Nations (UN) summit that was convened to create an evolving multi-stakeholder platform aimed at addressing the issues raised by ICTs through a structured and inclusive approach at the national, regional and international levels. The WSIS Summit in 2003 and 2005 served to galvanize global attention and mobilize action on this potential, and the ICT for Development community that emerged since then had been instrumental in this regard.

More needs to be done to fully leverage the potential of ICTs, and new technologies in general, to advance sustainable development in view of the digital transformation of societies and economies. This is particularly pressing as the digital revolution moves forward at an uneven pace around the world, with many developing countries lagging in digital development. One of the main challenges is of bridging the digital and knowledge divides, which includes the need to address disparities in both ICT infrastructure and the soft components, such as policy, content and capacity development at the same time, including digital access and capacity building for populations in rural areas. As more advanced economies consider frontier technologies (such as artificial intelligence, blockchain, or the

Internet of Things), the Least Developed Countries (LDCs) and Small Island Developing States (SIDS) lag in ICT capacities, access, including content in local languages on the Internet, infrastructure and use. This is a challenge that needs to be addressed to achieve the inclusive, more equal world envisioned in the 2030 Agenda, and requires the stepped up cooperation called for the by UN Secretary General.5

In this context, cooperation is urgent to achieve universal access and connectivity, to improve security and trust in ICTs, and to increase capacity-building. The integration of efforts across the UN system remains a significant challenge.

WSIS Action Line Facilitators Meeting

Pursuant to Article 109 of the Tunis Agenda, the thirteenth meeting of the UN WSIS Action Line Facilitators took place within the framework of the WSIS Forum 2019.

The purpose of the meeting was to assess the general progress made within the WSIS Action Lines, as well as to identify measures to strengthen the overall WSIS implementation process. In addition, this year's meeting will focus on innovating trends in ICTs and the implementation of the WSIS Action Lines to facilitate the achievement of the Sustainable Development Goals.

This session identified the key priorities, opportunities and challenges for their respective WSIS Action Line towards the achievement of the SDGs, in particular in line with the theme of the High level Political Forum 2019, empowering people and ensuring inclusiveness and equality.

WSIS Action Lines contributing towards empowering people and ensuring inclusiveness and equality

C1. The role of public governance authorities and all stakeholders in the promotion of ICTs for development (UNDESA)

The scale, spread and speed of change brought about by digital technology is unprecedented. As stated in GA resolution 72/242, the impact, opportunities and challenges of this change on sustainable development, including in cases where changes may occur at an exponential pace, are not fully understood. The resolution recognizes the need for Governments at all levels, the private sector, international organizations, civil society, the technical and academic communities and other relevant stakeholders to be aware of the impact of the latest developments in new technologies in achieving the Sustainable Development Goals.

As public institutions focus on the implementation of Agenda 2030 with the core principles of leaving no one behind and eradicating poverty, new technologies are creating both opportunities and challenges for future governance. ICTs can also offer governments an unprecedented opportunity to achieve sustainable development and improve the well-being of their citizens. Blockchain, Big Data and Artificial Intelligence are already employed by some central and local governments to improve public service delivery, predictive analytics, and participatory policy-making.

One related initiative under this action line and also from the UN system is Secretary-General's Strategy on New Technologies which was launched in September 2018. The goal of this internal strategy is to define how the United Nations system will support the use of new technologies like artificial intelligence, biotechnology, blockchain, and robotics to accelerate the achievement of the 2030 Sustainable Development Agenda and to facilitate their alignment with the values enshrined in the UN Charter, the Universal Declaration of Human Rights, and the norms and standards of international law.

C2. Information and communication infrastructure (ITU)

For the action line C2, the facilitator meeting and a thematic workshop are organized in 2019. This report summarizes the objectives of the two meetings.

1. **Action Line C2 Facilitator Meeting: Hybrid infrastructure and technologies for affordable broadband access**

In this session, participants discuss various broadband network technologies and infrastructure. In particular, different approaches to broadband infrastructure implementation are presented and their contributions to the Sustainable Development Goals are discussed. This include traditional mobile/fixed broadband, and other broadband solutions. The discussion focuses on practices and innovations to increase accessibility and affordability of broadband services to connect the unconnected. The following main themes are covered:

The discussions aim to:

•   Understand the challenges of connectivity in rural and remote areas
•   Present connectivity projects that aim on connecting those are left unconnected
•   Determine how to ensure affordability and accessibility of various projects (e.g., rural connectivity)
•   Enable relevant usage of the connectivity and applications

2. **Thematic Workshop: 5G Technology for developing countries**

5G holds the promises of very low latency, very high bandwidth and connecting more things. A handful of countries have already started the implementation of 5G such as South Korea, Russia, USA, and many developed countries are aiming to transition to 5G by 2020. On the other hand, many developing

countries are using 3G technology and some are transitioning to 4G technology. Some of these countries are still using 2G technologies, especially in rural areas where there exists no or incomplete infrastructure backbone. Transitioning to 5G will have different requirements and implications for developing countries where sometimes i) the infrastructure backbone may be incomplete, ii) there is limited legacy infrastructure, iii) the cost of broadband access is still high compared to the purchase power of most of the population. The main objective of this workshop is to bring together governments, industries and stakeholders to discuss (and share experience on the) the requirements and implications of the implementation of 5G projects for developing countries and

1.   Determine if 5G is a global technology that can address connectivity and accessibility issues in developing countries. Some of the questions are:
      -    Is 5G designed for developing countries and/or rural communities?
      -    Is 5G essential for (ICT) development in developing countries?
      -    Can developing countries afford to/not afford to implement 5G?
      -    Are there alternatives to 5G for developing countries?
2.   Determine if 5G requirements and benefits are achievable in a short term in developing countries, given the constraints of these countries.
3.   Discuss methods and mechanism for transitioning into and financing 5G in developing countries, where applicable

C3. Access to information and knowledge (UNESCO)

In order to further empower people and ensure inclusiveness and equality in the field of access to information and knowledge, UNESCO launched the UNESCO Global Observatory of Science, Technology and Innovation Policy Instruments (GO-SPIN) on-line platform. This platform is a new on-line, open-access and multilingual initiative with a complete set of information on STI policies and policy instruments for more than 50 countries across Africa, Latin America and Asia. The platform, developed with the financial support of the Swedish government, is a precious resource of information and a tool for monitoring and analysis of STI policies.

UNESCO has also initiated work towards a Recommendation on Open Science, based on the Recommendation on Science and Scientific Researchers adopted in November 2017 by the UNESCO General Conference, which addresses numerous issues related to WSIS. Notably, the recommendation underlines:

> *"18. Member States should recognize the international dimensions of research and development and, in this regard, should do everything possible to help scientific researchers, including: (...)*
>
> > *(e) taking measures against biopiracy; illicit trafficking of organs, tissues, samples, genetic resources and genetic related materials; as well as ensuring the protection of the human rights, fundamental freedoms and dignity of the human person, and the confidentiality of personal data."*
>
> *"21. So as to ensure the human right to share in scientific advancement and its benefits, Member States should establish and facilitate mechanisms for collaborative open science and facilitate sharing of scientific knowledge while ensuring other rights are respected."*
> *"26. Member States should establish as a norm for any scientific publishing, including publishing in open access journals, that peer review based on established quality standards for science is essential.*

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The third annual commemoration of the 28 September International Day for Universal Access to Information (IDUAI) offered excellent opportunities for Member States to draw attention to mainstreaming one of the central pillars supporting overall SDG achievement in the field of access to information to combat inequalities. In 2018, IDUAI critically evaluated the context of access to information and the growing relevance of advanced digital technologies like Artificial Intelligence now shaping how knowledge is accessed, processed and utilized. The event also provided an opportunity to reflect on how the suite of Open Technologies is changing the dynamics of teaching and learning and how it can be utilized to reduce risks arising out of digital influence on humanity.

UNESCO is working with a host of other organization through the Open Scholarly Initiative to establish a concrete case for openness and to develop broadly accepted, comprehensive, sustainable solutions to the future of open scholarship that work for everyone everywhere.

With regard to Software Heritage, in November 2018, UNESCO organized in collaboration with the Organization's Memory of the World (MoW) Programme, an expert meeting around the theme of preservation of Software Source Code as Heritage for Sustainable Development. The meeting was an important step forward in the partnership between UNESCO and INRIA (France), established in 2017. The meeting responded to the challenges of preserving documentary heritage in the digital era, and discussed the importance of software source code both as a document in itself and as a tool to favor access to information in today's knowledge societies. The outcome document adopted by the expert group – entitled "The Paris Call for Software Source Code as Heritage for Sustainable Development" – calls for major stakeholders and communities to be mobilized into action to preserve such software source code for the present and future generations and serve different needs of society, including scientific research, innovation, education, digital literacy and pedagogical approaches to computer science. The archive of Softwareheritage.org, a worldwide initiative supported by UNESCO to create a universal library of computer programme source codes, opened its doors at a launch event held at UNESCO's Headquarters on 7 June 2018.

In line with the Action Line C3, the UNESCO YouthMobile programme leverages computer literacy among young people for sustainable development to ensure inclusiveness and equitable access to digital skills and literacy. The session organized by UNESCO at the 2018 WSIS Forum on "Youth, Access to Knowledge, and the SDGs: Strategies for Building Youth Skills in Digital Technologies" highlighted policies and programmes that encourage youth involvement in ICTs. As one of the worldwide initiatives presented in the panel, UNESCO's YouthMobile introduces young people to computer science programming (learning-to-code) and problem solving (coding-to-learn). In 2018 the YouthMobile initiative worked with key partners to organize and provide training sessions, workshops, hackathons and competitions in Africa, Asia, Europe and the Middle East. As part of YouthConnekt a workshop hosted by YouthMobile in October supported the efforts of 25 young African app developers from six different African countries. Other events include 'Girls Can Code', 'Africa Code Week', 'UNESCO Hackathon', 'Room 7' and various boot camps, and trainings were also conducted within the YouthMobile initiative. The activities demonstrate the efforts of UNESCO's YouthMobile Programme to reduce digital inequalities, as well as spread the use of Open Source Software and Open Data for

civic engagement, education, science, culture, and the development of knowledge societies.

C4. Capacity building (ITU)

The WSIS Action line C4 on capacity building focuses on supporting development of skills for the use of ICTs. ICTs are becoming more and more affordable and accessible. This makes ICTs a mode of knowledge exchange and training that could be used to reach the majority of people promoting inclusiveness in learning and enhancing equality. In this light, the need to strengthen capacities to use ICTs should be a priority for all sectors of the economy. Action line C4 is also aligned to Sustainable Development Goal 4 (SDG4) on education.

Sustainable Development Goal (SDG) 4 calls for inclusive and equitable quality education and lifelong learning opportunities for all by 2030. This goal emphasizes the importance of inclusion and equity in creating a solid foundation for education and learning. This goal also calls for an upgrade of education facilities and programs to create learning environments that are inclusive, responsive, safe, non-violent, and are effective learning environments for all. To achieve this goal, there is need to put in place measures that could ensure inclusion and equality in education, as well as effectiveness of training in the face of rapid technological changes.

In light of the above, Action line C4 2019 session on capacity building focuses on new teaching approaches for higher learning institutions in the digital era. The discussion explores the opportunities and challenges that are brought about by introduction of new teaching methodologies, and the use of ICTs in training environments. The session notes that ICTs are important in ensuring inclusiveness through their user friendliness, ease of use and accessibility. The session also notes that, to realize the full potential of ICTs as a tool for inclusiveness in education, ICTs should be enhanced to be fully accessible to persons with special needs. Societies also need to be equipped to manage the potential negative impacts of the use of technologies in the classrooms such as reduced social interaction and learners focusing on the technology rather than on the concept being taught.

Examples of ITU's work in building capacity to support empowering people and ensuring inclusiveness and equality

- *ITU workshop on "Implementation of radio monitoring systems according to ITU-R recommendations" in collaboration with Rohde & Schwarz*

The Rohde & Schwarz/ITU Academy workshop on "Implementation of radio monitoring systems according to ITU-R recommendations" was held in Singapore in October 2018. Annually held at the

Hands-on practice

Some of the workshop participants

Rohde & Schwarz headquarters in Munich since 2013, the ITU Academy reached Singapore shores for the first time to bring the joint workshop to participants in the Asia-Pacific. This workshop is conducted for regulatory agencies and institutions in developed and developing countries. The workshop aims to provide participants with the necessary knowledge and tools required for planning, implementation and operation of spectrum monitoring systems, as well as encourage borderless collaboration.

- *ITU and International Telecommunications Satellite Organization (ITSO) training on "Satellite Communications: Technical and Regulatory considerations"*

ITU and ITSO offered a face to face regional training on "Satellite Communications: Technical and Regulatory considerations" in Quito, Ecuador. The workshop covered a wide range of issues relating to satellite communications, and satellite broadband services issues, including the role of the regional and international satellite communications organizations. This training was targeted at practicing engineers and information technologists as well as managers and employees from regulators, government institutions, and telecommunication companies, who are interested in acquiring a technical and regulatory understanding of VSAT and Satellite systems.

Participants during the training in Quito

C5. Building confidence and security in the use of ICTs (ITU)

We are in an era of massive technological advancements, driven by frontier technologies such as AI, 5G, Internet of things and many others. They hold great promise in revolutionizing the way we do things - offering potential solutions to many of the world's problems.

Building trust in cyberspace and in the usage of these new technologies will be crucial in ensuring that the all the world's people enjoy the benefits of ICTs, especially considering that in today's world, everything depends on ICTs – and particularly on the networks which underpin them. This includes essential national infrastructure and services such as: government services; financial services; emergency services; water supplies and power networks; food distribution chains; aircraft and shipping; navigation systems; industrial processes and supply chains; healthcare; public transportation; and even our children's education.

Standardization also has a key role to play. Interoperability of new security products and services

should be ensured from the early design stage.

Collaboration and cooperation among all stakeholders is key for strengthening confidence and security in the use of ICTs. A few examples of the partners that ITU is working with are provided in the figure below.

There are a number of positive initiatives globally, including within the UN System. It is important to focus on the overall coherence and the inter-linkages between the processes. It's important to design the processes with interlinkages for collaboration and cooperation as early as possible rather than as an afterthought, or there is a risk of duplication which dilutes rather than reinforce the global dialogue. However, with the right approach there is an enormous potential to multiply the effect of individual initiatives through partnerships and synergies.

In this regard, WSIS Action Line C5 facilitates the engagement of all stakeholders to help nations, in particular developing ones, to put a renewed focus on capacity building, and awareness raising among users of ICTs, particularly among the young and most vulnerable – thus helping ensure a smooth and secure transition to a digital ecosystem, and pave the way to sustainable socioeconomic development for all.

The National CIRT Programme is a good example of an activity relating to the implementation of WSIS Action Line C5 having contributed towards this goal:
As the WSIS Action Line C5 facilitator, ITU continuously works with Member States, partners and regional/international organizations to build capacity at national and regional level through the establishment of national Computer Incident Response Teams (CIRTs).

To date, 75 countries have received assistance to assess their national cybersecurity preparedness and response capabilities.

ITU has also completed direct engagement in 14 activities related to National CIRT establishment and

enhancement.

ITU consistently works with Member States to provide assistance in remodelling their cybersecurity readiness, protection, and incident response capabilities by administering cyberdrills at regional and national level. ITU has previously conducted 24 exercises involving more than 100 countries in all the six regions of ITU.
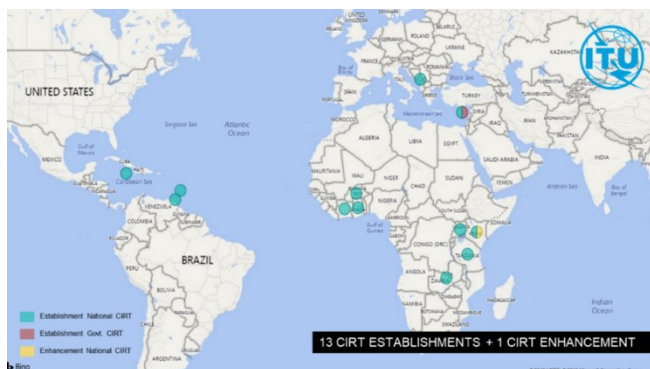

Figure shows a capacity building cyberdrill in progress.

C6. Enabling environment (ITU)

Digital transformation is sweeping across whole economies with mobile phones having become even more ubiquitous in their coverage and use, and thus becoming portals to a host of online services. It has become increasingly clear that policy makers and regulators are working together as well as with other stakeholders to shape policies and regulation to allow access to the benefits of digital technologies, while safeguarding and protecting consumers. It is in this spirit that ITU has developed the key concepts of 'collaborative regulation' and 'fifth generation' regulation to describe how policy makers and regulators can work together and across the sectors to remain effective in the fast-evolving digital markets of today and tomorrow. Taken together, their actions will help improve people's lives around the world and help achieve the Sustainable Development Goals (SDGs).

Policy and regulatory reform create the enabling environment to successfully leverage ICTs to help achieve the SDGs. Elements to be considered not only relate to supply, but also include incentives such as tax incentives as well as demand-side measures that can enhance the creation of content, including local content, applications, as well institutional adoption.

Recognizing the strong commitment of ITU's work towards bridging the digital divide and contributing towards empowering people and ensuring inclusiveness and equality in the area of the enabling environment, ITU has been acting as the sole facilitator for this Action Line since 2008, building upon its regular work carried out within the three sectors framework of the ITU-D Programme 3: Enabling Environment.

ITU carries out several activities directly related to WSIS Action Line C6, through projects. More information on these projects can be found on the ITU-D Projects webpage. (https://www.itu.int/en/ITU-D/Projects/Pages/default.aspx)

ITU convenes global and regional forums to discuss global trends in regulation for Sector Members and other national and international stakeholders, through organizing the Global Symposium for

Regulators (GSR) as well as strategic dialogues on policy, legal, regulatory, and economic and financial issues, and market developments. Since its launch in 2000, the annual Global Symposium for Regulators (GSR) provides a unique venue for regulators and policy-makers from both developed and developing countries to meet and exchange views and experiences and adopt Best Practice Guidelines. The meeting fosters an open dialogue between regulators and industry. The 18th edition of the Global Symposium for Regulators (GSR) was held from 9 to 12 July in Geneva under the theme of "New Regulatory Frontiers". The GSR attracted over 600 participants including government ministers, heads of ICT national regulatory authorities and industry executives from more than 125 countries. GSR also provided a platform for knowledge exchange between regional regulatory associations and private sector Chief Executive Officers. During GSR, participants agreed that governments, the private sector as well as all stakeholders in the digital economy should seek synergies and leverage their strengths and resources toward achieving sustainable digital development for all. The event culminated with the adoption by ICT Regulators of a set of best practice guidelines on new regulatory frontiers to achieve digital transformation. The 19th edition of GSR will be held from 9 to 12 July 2019 in Port Vila, Vanuatu.

The *Best Practice Guidelines adopted by regulators from around the world at the 2018 ITU Global Symposium for Regulators*[1] recognized that flexible and innovative policy and regulatory approaches can support and incentivize digital transformation. Proactive measures and exchanges with all players in the value chain in the sector (start-ups, competition hubs, manufacturers, operators, as well as users), they said, are key for boosting the emerging digital ecosystem. ICT policy and regulatory frameworks need to be up-to-date, flexible, incentive-based and market-driven to support digital transformation across sectors and across geographical regions. Next-generation collaborative ICT regulatory measures and tools are the new frontier for regulators and policy makers as they work towards maximizing the opportunity afforded by the digital transformation.[2]

The Regional Economic Dialogues (REDs) are dedicated to the discussion of economic regulation and finance. In 2018, two REDs were organized in Africa and the Americas to examine the economic implications of future technologies (Internet of Things (IoT) and Machine-to-Machine (M2M), Cloud Computing, Big Data and Block chain) and their application in the each region. These Dialogues also examined existing and emerging opportunities and challenges and explored opportunities for creating an enabling environment for ICT competitiveness and growth in the regions. To improve the synergy between ITU-D Study Groups and the strategic dialogues, ITU also organizes Experts' Knowledge Exchange meetings.

ITU continues to provide high-quality data, research, analyses, and tools (GSR discussion papers, publications, databases) to support membership in implementing and reviewing strategies, policies, and legal and regulatory frameworks as well as in moving towards evidence-based decision-making. Publications in 2018 included an ITU Report on Setting the stage for 5G: Opportunities and challenges, an econometric study on the Economic contribution of broadband, digitization and ICT regulation, and a report on Regulatory challenges and opportunities in the new ICT ecosystem, a report on Powering the digital economy: Regulatory approaches to securing consumer privacy, trust and security, and an overview paper on Digital identity in the ICT ecosystem, among others. ITU is working on collaborative regulation tools and research as well as on building blocks for a broader universal service (Universal service v.2) in future regulatory and legislative policy. UAS 2.0 will enable incorporation of the various dynamics of the telecommunications and ICT services sector and is more flexible and better aligned

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[1] https://www.itu.int/net4/ITU-D/CDS/GSR/2018/documents/Guidelines/GSR-18_BPG_Final-E.PDF
[2]

with the current convergence of services, networks and content. A set of recommendations and guidelines will be presented that will be used to improve procedures and mechanisms of universal service management and associated aspects, particularly in terms of financing.

The 2018 Global ICT Regulatory Outlook Report was launched in Q4 2018 - a second report in the annual series tracking market and regulatory trends in the ICT sector and their implications. The Global ICT Regulatory Outlook 2018 benchmarks regulatory progress worldwide. ITU tracks regulatory and market trends in the ICT sector with the ITU Regulatory and the ITU Tariff Policies surveys, which results are annually updated in the ITU ICTEye platform and the ICT Regulatory Tracker. The 2017 edition of the ICT Regulatory Tracker as well as an extensive collection of regulatory and policy data has been made available on the ITU website.

ITU also provides knowledge exchange tools and platforms to enable inclusive dialogue and enhanced cooperation and to raise national and regional awareness about the importance of an enabling environment. ITU web portals (portals on International Mobile Roaming (IMR) Resources, Quality of Service, the Digital Ecosystem, Infrastructure Development and a Regional Regulatory Associations Portal) bring together regulatory resources and ITU activities on topical issues of interest as well as activities and initiatives by regulatory associations, regional and international organizations and other stakeholders. ITU-D Study Groups provide an opportunity for all Member States and Sector Members (including Associates and Academia) to share experiences, present ideas, exchange views, and achieve consensus on appropriate strategies to address ICT priorities. Outputs agreed on in the ITU-D Study Groups and related reference material are used as input for the implementation of policies, strategies, projects and special initiatives in Member States. These activities also serve to strengthen the shared knowledge base of the membership.

BDT continues to assist countries by raising awareness, building and strengthening capacities and providing technical support through projects, trainings, workshops, seminars, forums, and conferences. Topics covered in 2018 included regulatory frameworks, competition analysis for digital applications, ICT development, broadband infrastructure, applications and services, costing and pricing approaches for digital communications services, International Mobile Roaming (IMR), 5G, e-agriculture, e-health, emerging technologies, infrastructure development, spectrum management, satellite coordination, Internet access, licensing, pricing, policy and regulatory collaboration in and strengthening digital financial services and digital financial inclusion, digital economy, etc.

C7. ICT Applications:

E-government (UNDESA/ITU)

Since 2001, DPIDG has published the United Nations E-Government Survey on a biennial basis. The Survey is the only global report that assesses the e-government development status of all Member States of the United Nations. The assessment rates the e-government performance of countries relative to one another, as opposed to being an absolute measurement. It recognizes that each country should decide upon the level and extent of its e-government initiatives in keeping with its own national development priorities and with a view to achieving the Sustainable Development Goals. The 2018 edition of the Survey is launched in July 2018.

The 2018 Survey shows that an increasing number of countries now proactively use networking opportunities to engage with people, especially through the means of e-participation, and evolve

towards participatory decision-making as recommended by one of the targets of the SDGs. 74 countries have dedicated mobile apps to deliver online services, while 83 countries indicated that they are providing some form of mobile service through short message service (SMS), mobile apps or the equivalent. Mobile devices are proving to be helpful in bridging the access divide; fixed-broadband and mobile-broadband prices are falling, making ICTs more accessible and affordable.

The Survey tracks progress of e-government development via the E-Government Development Index (EGDI). The EGDI, which assesses e-government development at the national level, is a composite index based on the weighted average of three normalized indices. One-third from the Online Service Index (OSI) based on data collected from an independent survey questionnaire entitled Online Service Questionnaire (OSQ), conducted by UNDESA, which assesses the national online presence of all 193 United Nations Member States; one-third is derived from the Telecommunications Infrastructure Index (TII) based on data provided by the International Telecommunications Union (ITU); and one-third from the Human Capital Index (HCI) based on data provided by the United Nations Educational, Scientific and Cultural Organization (UNESCO).

E-business (UNCTAD/ ITC/UPU)

How does the action line relate to the topic empowering people and ensuring inclusiveness and equality?

Enhanced use of ICTs in rural enterprises and access to e-business services and e-commerce can play an important role in increasing the productivity of small-scale food producers. By using e-business to build local and international market places for the sale and distribution of food, and using innovative payment solutions, such as remittances for e-commerce, mobile payments and digital currencies, small traders from developing countries are empowered to integrate the global economy, and financial services become more inclusive. E-commerce provides the possibility for men and especially women to have equal rights to economic resources by selling local goods and services online. An important way to facilitate exports from developing countries is to strengthen the ability and readiness of firms to engage in B2C and B2B e-commerce.

Challenges

Increasing the ratio of businesses operating in the formal sector has long been a policy objective of governments of developing and least developed countries. The benefits for government are clear: a higher taxation base and the ability to understand, measure and contribute to the development of the private sector. Micro, small and medium enterprises have resisted this pressure in many countries: aiming to avoid the administrative and fiscal burdens that come with being registered. But there should

also be many benefits for firms to be formal and conduct e-Business – including opening new markets and reducing costs (of handling cash). Furthermore, an ITC survey on global competitiveness showed that MSMEs in developing countries face barriers at earlier stages in the process of establishing an online business and twice as high logistics costs, which in turn have a significant impact on their ability to compete, their resiliency and sustainability. These "early stage" barriers are particularly impactful in least developed countries, and among rural, micro and women-owned enterprises.

Opportunities

E-business should increase the potential to bring small firms into the formal economy: in principle e-commerce implies a higher degree of visibility on business transactions - it may be increasingly difficult to stay informal. This may not always be the case – the use of mobile money in Africa for instance supports continued flourishing of informal business. In terms of Goal 17 for a revitalized global partnership, actions by UNCTAD to promote the integrated treatment of trade have found opportunities to harmonize legal frameworks for digital trade in developing regions. Such harmonization increases public trust in online transactions, facilitates domestic and international trade online, and offers legal protection for users and providers of e-business services. The UPU and the ITC are exploring opportunities to facilitate trade through partnerships with governments and the private sector, including to provide many of the supporting services that SMEs in poor countries require to trade internationally in a sustainable manner.

Emerging Trends

Cooperatives are emerging as the most suitable collaborative business model to African MSMEs to cross-border e-commerce. Diaspora crowd-sourcing is opening avenues for financing an underserved market of African tech entrepreneurs, mostly in the services sector, that are starting small but dreaming big.

Example

DOKMAI is a manufacturer of handmade leather goods and accessories in Kigali, Rwanda. It employs 18 people, most of them women, who work on the creation of articles aimed at local and international clientele and who were fully trained by the company. To grow high margin international sales, Bernadette Umunyana, founder, is developing the company's presence online, especially in Europe, the US and China. The company is being assisted to improve its online presence through e-commerce webpages and international marketplaces as part of a 2-year project managed by ITC in partnership with GIZ and the international transport company DHL. Along with around 150 other companies, the goal is to increase awareness and ability to serve customers online.

Apart from the improvements in e-commerce, DOKMAI has begun to participate more actively in international events and has joined a working group with the Ministry of Trade and Industry of Rwanda, ITC, Inkomoko and various domestic enterprises to establish a domestic trade hub. DOKMAI is ready to collaborate and share its experience with other companies in order to promote "Made in Rwanda"

as a recognized quality label.

E-health (WHO)

E-employment (ILO)

E-environment (WMO/UNEP/ITU)

Access to environmental data and related services is essential to improve managing risks and developing strategies for sustainable development. Monitoring and predicting the state of the Environment in the atmosphere, land and ocean is a fundamental component of managing risks associated with the changing climate. Extreme hydro-meteorological events currently account for more than 80% of the world's disasters. These are expected to occur with greater frequency and intensity as greenhouse gas concentrations continue to rise. Society's exposure and vulnerabilities to these hazards will be exacerbated due to population growth, reaching more than 9 billion by 2050, further urbanization and growth of mega cities worldwide, particularly in flood plains and coastal zones.

Providing access to environmental information and best practices to deal with weather and climate extremes, air quality and pollution, climate risks and impact contributes to empowering nations, societies and people to adapt to climate change. Progress in ICT and its infrastructure and making it affordable to all will help access to Environmental information and services on equal and inclusive basis.

Challenges include

- Technology gaps for connecting the most vulnerable countries to the digital knowledge
- Maintaining data infrastructure operating in reliable and sustainable manner (due to lack of resources and capacity)
- Mainstreaming approaches for dealing with Environmental and climate issues remain a slogan more than action in the field in many cases,
- Prioritization of limited resources

Opportunities

- Global agendas such as such as the Sendai Framework on Disaster Risk Reduction addresses some of the challenges above, in particular 3) and 4)
- Existence of Framework of Collaboration among key stakeholders at global level and between Hydro-Meteorological entities and ICT operators at national level, helps making easy access to technological solutions, standards and guidelines for timely exchange and access to reliable climate change and extreme events information

Emerging trends include

- Improved ICTs with high broadband Internet access and new generations of technology has already started and will exponentially improve the delivery of environmental information, such as early warnings to all.
- Adopted strategies by various stakeholders for supporting Environmental/climate-smart decision making will build resilience and adaptation to climate risk by enhancing socioeconomic value of weather, climate and related environmental services.
- The use of Big data and crowdsourcing is creating new opportunities to collect and analyze data and at the same time delivering reliable weather, climate and environmental information for various applications.

E-agriculture (FAO/ITU)

Digitalisation can strengthen the Food and Agriculture Sector in terms of viability, sustainability, resource conservation, resilience and consumer orientation. A recent Communiqué from the Agriculture ministers at the Global Forum for Food and Agriculture 2019 expressed their goal to ensure that the interests of agriculture are taken into account in the drawing up of international principles, guidelines and standards for the management of digital data and are integrated into the existing international networks and formats.

Increasingly, stakeholders interested in sustainable development are relying on open innovations and open source solutions when it comes to digital technologies. This openness leads to a variety of potential challenges, including: data privacy and sovereignty, intellectual property, ensuring fair and inclusive distribution of devices and related trainings, and financial sustainability of these approaches, to name a few.

Hunger is on the rise and the situation is worsening in South America and most regions of Africa. Climate resilience is one solution. It is important to strengthen food systems and people's livelihoods to anticipate and adapt to the effects of climate variability and extremes. At the same time, reducing

food loss, preventing price volatility and distortions in world agricultural markets and opening up value chain opportunities for small scale farmers can improve the resilience and enhance the capacity for agricultural productivity of the most vulnerable groups in rural areas.

The potential of Data, Science and Innovation to produce sustainable and scalable solutions for achieving SDG2 are enormous. They provide key actors with increased early warning and early action capabilities. Big data in digital agriculture is used for the assessment and forecasting of **a)** agriculture productivity (e.g. index based (re)insurance schemes, provision of micro credits), **b)** animal and plant pest and diseases (e.g. Fall Army Worm, Banana disease, Rift Valley Fever), **c)** food prices (e.g. sentiment analysis). However, much of the training data is propriety data of large private companies.

Artificial Intelligence should be addressed in an ambitious and holistic manner, promoting the use of AI as a tool in the implementation of the SDGs, while also addressing emerging ethical and human rights, technical and socio-economic challenges. Aligned to the UN Secretary General's vision that the digital revolution should not be used to deepen the digital divide, or negatively impact women and children and other disempowered persons, the Food and Agriculture sector need to advocate for the *strategic deployment of (disruptive) digital technologies, business models and process with sustainable approach*.

To this end, FAO is conducting a number of Proof of Concepts to test the utility of digital technologies and innovative approaches for sustainable development in food and agriculture. The underlying key values we use to guide our approach in this emerging area are those that are rooted in a deep understanding of the local reality (political, economic, social and human conditions) using human centered design, which we will expound on in later sections.

Those who do not have access or with a poor access to digital technologies (digital divide), either through economic or social restrictions rarely benefit from these sorts of approaches, and surely not to the extent as their more digitally literate counterparts. When digital technologies are required for FAO programs to be successful, it is critical that we support those groups with access problems to leapfrog old-fashioned/defunct technologies and approaches to digital technologies that can be customized to suit their needs, as well as ensure that the requisite infrastructure is in place to allow them to optimize all available options.

Moreover, we have found a way to democratize the approach to digital cooperation, and better capture and represent the voices of those who are envisioned to be recipients of these technologies. Utilization and reach of online fora and virtual meeting spaces, including social media, should be substantially increased, including those whose problems we will attempt to address, in part, through the use of these technologies.

Although all of the above areas could benefit from greater digital cooperation, we will focus on inclusive development and closing the digital gap. We know that digital innovation and entrepreneurship are key drivers of economic and social growth in developing countries. Either to attract and keep Youth in the field or to promote digital literacy. However, access to the tools and knowledge related to digital innovation and technologies is not equitable across genders, age groups, geographic distribution, and other physical and socioeconomic characteristics. While the most obvious barrier to closing the digital gap is the lack of infrastructure (hygienic conditions) in the least developed areas of the world, there are far more intractable challenges (some of which are mentioned above) that must be addressed through an interdisciplinary approach.

Beyond cost, barriers to mobile ownership tend to be related to the local context, with low digital literacy and literacy standing out in several markets, and safety and security concerns in Latin America, all of which tend to affect women disproportionately. In the context of sustainable development, we must also consider the rural digital divide, in which rural populations are disproportionately affected, as they more frequently lack the infrastructure to enable easy access and use of digital technologies, as well as being subject to lower rates of digital literacy due to lower rates of education and transfer of skills and knowledge of the potential uses of digital technology to support themselves and their families.

While UN agencies can better understand the more straightforward problem of infrastructure development needs to address one component of inclusive development and closing the digital gap, addressing the more intractable social and behavioral root causes for the digital divide remains a challenge. As stated above, effective education and socio-behavioral change campaigns will need to be integrated into all programs that utilize digital technologies, to ensure that we do not inadvertently increase this gap.

Study Case

It is challenging to identify sustainable, replicable successes in this sector. One promising example of cooperation among stakeholders in this area is in mobile finance. Given the lack of financial inclusion for many marginalized populations, even simple feature phones can provide transformational access to financial services for this otherwise excluded population. In the case of M-Pesa, a mobile money transfer service launched in 2007 in Kenya by telecommunications company Safaricom, their service was associated with an increase to over 75% of financial inclusion of the adult population in 2016 (versus ~26% in 2006)[3]. In this case, innovations in the financial market accompanied by appropriate policy design, appropriate regulatory technology and regulatory capacity, in addition to partnerships among regulators and the Governments combined in a way to allow for an emerging technology to dramatically increase financial inclusion and decrease the digital divide. Women, in particular, confirmed that they felt they could save their money in a safe place and that they were less likely to spend it when it was saved through M-Pesa.[4] However, the success of M-Pesa has also led to their market dominance, which could have unknown negative effects, should they change their approach to disadvantage women and other marginalized populations. When considering where further cooperation is needed, we should consider the importance on the regulatory framework and enabling environments from which these digital technologies emerge. If we wish to continue to improve digital inclusion and decrease the divide, we should improve our coordination among all stakeholders to support rational, evidence-based policy that will enable maximum impact of these technologies without disproportionally excluding potential beneficiaries due to their gender, location, socioeconomic status, etc.

E-learning (UNESCO) **E-science** (UNESCO)

In order to empower people and ensure inclusiveness and equality in the fields of e-learning and e-science, and in follow-up to the Qingdao Declaration (2015) on leveraging ICT for Achieving Education 2030, UNESCO convened the second International Conference on ICT and Education 2030 which adopted the Qingdao Statement (2017) designed to guide implementation strategies for unleashing

[3] https://www.sciencedirect.com/science/article/pii/B9780128104415000038
[4] http://www.fao.org/3/i8670en/I8670EN.pdf

the potential of ICTs to help reach the SDG-4 targets. The third International Conference will be held in China in May 2019 with a focus on "Artificial Intelligence and Future Education."

UNESCO has launched the Gender Assessment Tools for Teacher Education to identify and address gender gaps and biases in teacher education policies, teaching-learning materials and practices. The results yielded from applying the six gender assessment tools help to reveal areas that need to be addressed to make teacher education more gender-sensitive and gender-responsive.

UNESCO continues to maintain the Global ICT in Education Policy Platform (launched in 2016) to facilitate the on-going policy debates on leveraging e-learning to promote quality education and to advance inclusion, equity and gender equality. More than 50 countries have developed or updated their national ICT in education policies and master plans with a view to promote e-learning for all with the direct support of UNESCO.

In follow up to the 2nd World OER Congress in Ljubljana, Slovenia, which adopted the 2017 and Ljubljana OER Action Plan and accompanying Ministerial Statement, UNESCO is drafting the OER Recommendation to further the adoption of Resolution 44 'Desirability of a standard-setting instrument on international collaboration in the field of Open Educational Resources (OER)'. UNESCO will also start administrating the OER Indicators that measure the adoption and impact of OER. In 2017-18, UNESCO provided assistance to more than 20 countries in supporting the development of national policies and strategies for adopting OER.

UNESCO is currently finalizing the publication, *Guidelines on the Development of Open Educational Resources (OER) Policies*, a guidebook on how to develop an OER policy from conception to implementation. Each chapter provides in-depth contextual information, real policy examples, and guiding questions to help facilitate the process of adopting an OER policy. The book is also intended to engage stakeholders to review and assess existing OER policies as well as provide direction on the monitoring and evaluation of the implementation of OER activities

A framework for an online monitoring resource for the implementation of the Ljubljana OER Action Plan in five strategic areas was developed with major OER networks during this period. The Ljubljana OER Action Plan five strategic areas are: building the capacity of users to find, re-use, create and share OER; language and cultural issues; ensuring inclusive and equitable access to quality OER; developing sustainability models; and developing supportive policy environments. This resource is foreseen to be operational in early 2019.

UNESCO provided assistance to some 15 countries to support the development of teacher training in ICT and Education using Open Educational Resources (OER). UNESCO published the ICT Competency Framework for Teachers (ICT CFT) Version 3 in 2018 which outlines a set of competencies that teachers need to integrate ICT into their practice and professional development to advance student learning. The Version 3 integrates emerging trends in technology, including artificial intelligence; Social Network; E-safety and E-ethics; Inclusion of issues related to accessibility for Persons with Disabilities and OER. This document was launched at E-Learning Africa 2018 (Kigali, Rwanda) and at the International Day for Access to Information (IDUAI) 2018 celebrations in Colombo, Sri Lanka in September 2018. The ICT CFT implementation supported through the development of openly licensed materials adapted to national contexts has been developed by over 10 countries, with the support of UNESCO. A dedicated hub for OER linked to the ICT CFT has been further developed.

A draft text for the OER Recommendation was developed during this period, further to 39 C/Resolution 44, by which the UNESCO General Conference in November 2017 requested the Director-General to submit to it, at its 40th session, a draft text of a recommendation on OER, in November 2019.

Through its annual Mobile Learning Week, UNESCO has been organizing capacity building workshops, symposiums, policy forums and strategy labs to help governments and other education stakeholders discover ways to harness the power of widely available mobile technology and other technological advances including Artificial Intelligence. The Mobile Learning Week 2018 focused on "Skills for a connected world" while the theme for the 2019 edition of the event was "Augmented intelligence and humanity." UNESCO also supports countries in planning and implementing projects on how to use mobile learning for literacy education and supporting teachers with mobile technology. In 2017, UNESCO reviewed current practices and strategies to harness mobile learning for refugees and displaced populations, through the publication 'A lifeline to learning: Leveraging mobile technology to support education for refugees'.

Through the UNESCO King Hamad Bin Isa Al-Khalifa Prize for the use of ICT in Education, UNESCO has identified and brought attention to innovative approaches around the world in e-learning. The most recent prize-winning laureates (2017), from Morocco and India, addressed the theme of "ICTs to Increase access to Quality Education." The theme of the 2018 edition of the Prize is 'The use of innovative ICT to ensure education for the most vulnerable groups'. It will reward projects that leverage innovative technologies to deliver quality education for excluded vulnerable groups, including out-of-school children, illiterate or under-skilled youth and adults who suffer from cultural and economic barriers, personal disabilities, gender-based barriers and/or crises.

Recent ICT-led innovations in environmental sensing, data processing, and interactive visualisation show promise for participatory knowledge generation. UNESCO and its partners are implementing Landslide-Environmental Virtual Observatories (Landslide EVO) to support this approach to e-science.

In line with Action Line C7, UNESCO partnered with Redalyc and CLACSO to initiate Amelica, which is a **dedicated community-driven sustainable framework for Open Knowledge for Latin America and the Global South** (amelica.org). It is a new configuration of strategies, in response to the international, regional, national and institutional context, which seeks a collaborative, sustainable, protected and non-commercial Open Access solution for Latin America and the Global South.

C8. Cultural diversity and identity, linguistic diversity and local content (UNESCO)

In order to empower people and ensure inclusiveness and equality and in line with Action line 8, UNESCO has continued to integrate ICTs in its programme of work on Culture in 2018. The protection and promotion of cultural heritage in all its forms, linguistic diversity, the diversity of cultural expressions and the creative economy increasingly rely on ICTs, as do measures to reach wider audiences and share information. Member States, private sector and civil society partners working with UNESCO in the field of Culture in standard-setting, capacity-building, and awareness-raising are contributing to the implementation of Action line 8.

UNESCO Convention for the Protection and Promotion of the Diversity of Cultural Expressions (2005). In line with its roll-out strategy, the Global Report: Reshaping Cultural Policies, Advancing Creativity for Development was launched in new language versions in regions across the globe. The full Global Report exists in English, French, Korean, Portuguese, and Spanish, and its Executive Summary in Arabic,

Bahasa (Indonesia), Chinese, English, French, German, Khmer (Cambodia), Mongolian, Portuguese, Russian, Spanish and Vietnamese. Such launch events provide opportunities to examine developments and good practices on the use of digital and interactive content and technology in the cultural and creative industries, as well as the elaboration of policies thereon. A new partnership established with Ms Sabrina Ho, a young entrepreneur, and an initiative "You Are Next: Empowering Creative Women" was launched. This initiative has so far granted funding to four projects from Mexico, Palestine, Senegal and Tajikistan that support women under 40 to access funding, infrastructure, equipment and co-production opportunities in the digital creative industries.

Projects supported by the International Fund for Cultural Diversity include "Retina Latina", which aims to further develop the Latin American film industry in the digital era through supporting the distribution and access to Latin American cinema by improving the digital platform, reinforcing distribution strategies, creating partnerships and regional integration. UNESCO elaborated a roadmap to support the implementation of the "Operational Guidelines on the Implementation of the Convention in the Digital Environment", for understanding, interpreting and implementing the Convention in a digital environment where cultural goods and services are created, produced, distributed, disseminated, consumed and/or stored electronically. These goods and services transmit cultural expressions through, for example, a computer program, a network, a text, a video, an image or an audio recording and are distributed through constantly evolving digitally-encoded platforms.

UNESCO Convention for the Safeguarding of the Intangible Cultural Heritage (2003). In November 2018 UNESCO launched an innovative web-based platform 'Dive into Intangible Cultural Heritage'. Using cutting-edge technology such as web-semantics and graphic visualization, the platform provides the users possibilities to navigate through a dynamic and interactive space of vibrant intangible cultural heritage practices and expressions. Over 500 elements inscribed on UNESCO's Lists of the Convention for the Safeguarding of the Intangible Cultural Heritage can be explored across various domains, themes, geography and ecosystems, making it possible to visualize a remarkable cultural diversity and inter-connections among the cultural elements.

Within its global capacity-building strategy, UNESCO developed a large set of pedagogic materials on different aspects of the intangible heritage safeguarding, which are available in several languages free of charge on the Convention's webpage. Experts, universities, NGOs and researchers are among the main users of these materials. A webinar coordinated between UNESCO's Education and Culture Sectors introduced intangible cultural heritage and its relationship with education for sustainable development (ESD), to key partners working on this subject. A virtual conference with the International Centre for Technical and Vocational Education and Training (UNEVOC) on safeguarding intangible cultural heritage through technical and vocational education and training (TVET) was also co-organized. A set of guidance materials on integrating intangible cultural heritage in education, is under development within the European Year of Heritage 2018 in close cooperation with the UNESCO Associated Schools Project Network. ICTs are used to exchange experiences between implementing schools and to share the results.

UNESCO Convention concerning the Protection of the World Cultural and Natural Heritage (1972). The World Heritage State of Conservation Information System, launched in 2012, offers a trove of reliable data on the state of conservation of natural and cultural World Heritage properties since 1979 and the threats they have faced in the past, or are currently facing. It makes publicly available over 3.627 reports on 566 World Heritage properties located in 144 countries. The UNESCO World Heritage and

Sustainable Tourism Programme has developed, in the framework a high-profile project supported by the European Union and in partnership with National Geographic, an interactive web platform that features four trans-European itineraries linking iconic and lesser-known World Heritage sites under the themes: 'Romantic Europe', 'Ancient Europe', 'Royal Europe' and 'Underground Europe'. 34 World Heritage sites from 19 European Union countries are participating in the project. The project aims to increase sustainable tourism at World Heritage sites, while encouraging visitors to stay longer and support local culture and the creative economy. www.visitworldheritage.com

The World Heritage Centre actively carried out, through its web platform, a number of global outreach initiatives including:

- The publication on line, in English and French, of the work World Heritage for Sustainable Development in Africa.
- The publication on line, in English and French, of the UNESCO-UNITAR joint publication Five Years of Conflict: The State of Cultural Heritage in the Ancient City of Aleppo.
- A crowdfunding campaign called #HelpVirunga, to contribute to the Fallen Rangers Fund, for the widows and children of Virunga rangers killed in the line of duty.
- The digital photo contest #MyAfricanHeritage, recording the submission of some 1,700 photographs expressing the richness and diversity of the African cultural and natural heritage.
- An online consultation of the World Heritage Convention on its Reactive Monitoring mechanism that allows stakeholders to access information.
- The publication the World Heritage Review, the quarterly magazine available in a flip-page version on the World Heritage Centre website in English, French and Spanish versions.

The World Heritage Education Programme, in its diverse activities and projects, systematically uses ICT, social media and communication tools in order to raise awareness and get young people involved in World Heritage protection and preservation.

- The World Heritage Volunteers Initiative (WHV) mobilizes organizations, institutions as well as national and international volunteers in concrete actions for the protection and preservation of our World Heritage, through annual campaigns. WHV campaigns are launched on the World Heritage Centre Website and spread online on the official social media platforms and Webpages to reach youth and give them the opportunity to participate.
- Patrimonio's World Heritage Adventure is a cartoon series produced through a "By young people, For young people" approach. Young people are invited to convey the message of World Heritage Preservation by participating to national and international storyboard competitions that are launched on the World Heritage Centre Website and spread online on the official social media platforms and Webpages. So far, 14 episodes have been produced and are available online, on YouTube and in digital formats free of charge.
- The World Heritage in Young Hands Kit is a pedagogic material based on an interdisciplinary approach, aimed at involving teachers in raising awareness of the importance of World Heritage and at incorporating World Heritage into the curriculum. The Kit presently exists in 38 national language versions and it is available online free of charge on the World Heritage Centre Website.

UNESCO Convention on the Means of Prohibiting and Preventing Illicit Import, Export and Transfer of Ownership of Cultural Property (1970). UNESCO launched a new electronic tool through which States Parties can submit their national report on the implementation of the Convention. This new tool aims at developing a comprehensive, searchable database encompassing policies, legislative systems, and implementation and operative frameworks of States Parties. In addition, it will present facts regarding good practices and international cooperation, as well as up to date statistics concerning thefts, illegal excavations, seizures and restitutions.

UNESCO has continuously worked on raising awareness on illicit trafficking through online campaigns. These included 13 audiovisual clips that target the public, tourists and youth. The online Database of National Cultural Heritage Laws provides thousands of cultural laws from 188 countries. The information is regularly updated and open to the public.

With regard to Museums, UNESCO partnered with the Institut du Monde Arabe and ICONEM on the digital exhibition, "Cités millénaires. Voyage virtuel de Palmyre à Mossoul" ("Age Old Cities: A Virtual Journey from Palmyra to Mosul"), which showed at the Institut du Monde Arabe (IMA) in Paris, taking visitors on a virtual journey to four of the most culturally important sites of the Arab world: Mosul (Iraq); Aleppo (Syrian Arab Republic); Palmyra (Syrian Arab Republic) and Leptis Magna (Libya). It offered visitors the opportunity to explore buildings, dwellings and archaeological remains of the sites through 3D virtual reconstructions on giant projections, virtual reality experiences, archival documents and images, as well as videos and testimonies of local populations. As a partner of the exhibition, UNESCO made available to the public its exclusive data and the results of its field surveys, via satellite imagery, in Mosul, Iraq.

The 2015 UNESCO Recommendation concerning the Protection and Promotion of Museums and Collections, their Diversity and their Role in Society specifically addresses the issue of ICTs and acknowledges the key role they play in providing opportunities to museums in terms of preservation, study, creation and transmission of heritage and related knowledge; while also stressing the need to ensure museums have effective access to these technologies in order to improve their primary functions (preservation, research, communication and education). Capacity building workshops organized for museum professionals in China, Kuwait and Lebanon included the use of ICTs to digitize documents and inventories.

Culture in Emergencies. ICTs are contributing to heritage protection, particularly in view of increasing attacks on cultural heritage and the vulnerability of such heritage in emergency situations, including natural disasters. A drone survey of Mosul, Iraq, produced by ICONEM for UNESCO is helping experts plan the reconstruction of some of the hardest hits sections of this historic city through UNESCO's initiative Revive the Spirit of Mosul, and is an important visual communication tool that provides the general public, through images and videos, a heightened awareness of the extent of devastation that befell Mosul.

Launched during the International Conference on the Reconstruction of Iraq, held in Kuwait in February 2018, Revive the Spirit of Mosul is one of UNESCO's most significant undertakings, involving the complete restoration and rehabilitation of the city's cultural heritage and the revival of its education and cultural institutions. A significant focus has been placing the human dimension at the heart of recovery efforts, addressing multiple areas critical to promoting sustainable Knowledge and Information Societies, including through planned work with museums, libraries, cultural heritage sites, schools and Universities. In September 2018, a landmark conference was held at UNESCO

Headquarters in Paris to mobilise the international community for the city's reconstruction and recovery.

Since the signature of a Memorandum of Understanding (MoU) in June 2015, UNESCO and the Operational Satellite Applications Programme (UNOSAT) of the UN Institute for Training and Research (UNITAR) are cooperating on a regular basis for the monitoring, via satellite imagery, of heritage destruction and damage in Iraq, Syria, Libya and Yemen. Under this partnership UNESCO provides advice on the sites that require monitoring, the choice of experts to conduct analyses and comparative data before the damages, while UNOSAT provides imagery and imagery analysis to UNESCO. Two joint publications assessing the cultural heritage sites of Syria and on the Ancient City of Aleppo based on satellite imagery are being published with a view to contributing to larger planning for recovery at the UN and national level. These publications include visuals of and interactive access to digital models in 3D based on photographic material obtained on site, in the framework of the MoU.

C9. Media (UNESCO)

Given increasing social, economic and political challenges related to freedom of expression and media development, and in order to empower people and ensure inclusiveness and equality as it concerns freedom of expression, UNESCO and media stakeholders have developed a number of new initiatives and activities, through building numerous and successful partnerships so as to advance the media agenda significantly in a concerted way.

In 2018, UNESCO has actively advocated for and ensured multi-stakeholder consultation on the Internet Universality Indicators framework through global consultations online and offline in an innovative, open, and inclusive manner. 46 events were organized and 2000 experts engaged to promote the Internet Universality Indicators as a comprehensive tool for achieving the SDGs. This was done through creating synergies at the WSIS Forum, the RightsCon, the Global Media Forum, the Annual Conference of IAMCR (the International Association for Media and Communication Research), the EuroDig, the FIFAfrica, the ICDPPC (the International Conference of Data Protection and Privacy Commissioners) and the IGF (Internet Governance Forum). These indicators were developed in a collaborative manner with all stakeholders and thus serve as a unique, highly relevant and comprehensive tool for all stakeholders to develop and implement at national levels media and Internet policies that are in line with international human rights standards.

On the **International Day to End Impunity for Crimes against Journalists** (IDEI), UNESCO launched a global campaign, **#TruthNeverDies**, in association with media partners from all over the world. UNESCO also launched the Observatory of Killed Journalists, an online database providing information on the status of judicial enquiries into each killing of a journalist or media worker recorded by UNESCO since 1993, based on information provided by the country in which the killing took place. This innovative database also provides information about the status of judicial enquiries and, in many cases, makes available documents from national authorities on judicial proceedings. Country profiles allow insights into levels of impunity per country.

The 2018 edition of Global Media and Information Literacy Week took place from 24 to 31 October 2018 in Kaunas (Lithuania) and Riga (Latvia), under the theme "Media and Information Literate Cities: Voices, Powers, and Change Makers." The feature conference was followed by the Global MIL Week 2018 Youth Agenda Forum, organized by and for youth around the theme of "Media and Information Literate Cities in the Era of Algorithms: Youth Voices." This best practice of MIL advocacy will be

expanded in the future to serve the increasing need of empowering users in the digital age.

To mark the **International Day for Universal Access to Information** (IDUAI), on 27 September 2018, the third annual IPDCtalks were successfully held in Tunis (Tunisia), with eight satellite IPDCtalks in other countries to highlight and elaborate on the importance of access to information for all sustainable efforts around the world. On 28-29 September 2018, UNESCO and the Sri Lankan authorities co-organized a flagship international event in Colombo (Sri Lanka), entitled "The Asian Digital Revolution: Transforming the Digital Divide into a Dividend through Universal Access," as part of IDUAI commemorations held around the world.

In its bid to continue promoting specialized literacies, the IPDC set aside a special allocation to support the production of a syllabus on "fake news," which has analyzed the changing news ecosystem and the rise of fake news, while providing a basis for professional journalism and news literacy. In September 2018, UNESCO published a new Handbook for Journalism Education and Training, entitled "**Journalism, Fake News & Disinformation**". Developed as part of the IPDC Series on Journalism Education, the Handbook is aimed mainly at journalism educator and trainers, but also at practicing journalists, editors and others who are interested in the quality of the information in circulation.

Regarding the monitoring and reporting of SDG 16, two global reports on indicators 16.10.1 and 16.10.2 have been submitted to the UN Statistics Division in February 2018. These reports have been included in the UN Secretary-General's Progress Report on Sustainable Development Goals. The IPDC Secretariat is developing two instruments for SDG 16.10.2 monitoring, which can also be used by Member States in their national evaluation processes.

In line with action lines C3 and C9, UNESCO has been actively involved in the thirteenth Annual Meeting of the Internet Governance Forum (IGF) hosted at UNESCO HQ from 12 to 14 November 2018. Attended by more than 3000 representatives in Paris from all stakeholder groups, government, civil society, the technical community, private sector, and academia, the forum was held under the theme "Internet of Trust." The IGF actively promoted an open and multi-stakeholder dialogue and encouraged an exchange of ideas to improve the way the internet is governed. The event was web streamed and drew active remote participation. The IGF highlighted the essential role of the Internet as a tool for inclusion and for accessing and sharing information and knowledge, impacting cultures, economies and everyday life. The forum underlined the need of a community-built set of values and standards to ensure that the internet stays free, inclusive, open and safe for everyone. UNESCO and partners organized an open forum on "Measuring a free, open, rights-based and inclusive Internet", and several workshops on the subjects of "Preventing Youth from Online Violent Radicalization", "Preventing Youth Violence Through ICTs" and "Artificial Intelligence for Human Right and SDGs."

UNESCO also supported a side-event hackathon on information disorders in the digital era organized in the framework of the IGF by Agence France Presse (AFP), Internet Society France (ISOC France), Renaissance Numérique, and Savoir*Devenir. The initiative brought together over 60 experts, academics, associations, developers, journalists, and students over 3-days in order to propose cross-curricular and practical solutions to information disorders: fighting against online hate speech and fake videos, promoting media and digital literacies solutions.

On the margins of the IGF, UNESCO organized an Open Discussion on "Harnessing Artificial Intelligence to advance Knowledge Societies and achieve Good Governance", organized in partnership with the Internet Society and the Mozilla Foundation. These discussions included and triggered discussion on

how these technologies impact on human rights, journalism and the media. UNESCO engaged with a group of media organizations and hosted a side event of IGF on Symposium on Media Development and Internet Governance which aimed to develop media development strategies to shape global Internet governance.

In order to promote democracy and freedom of expression, a number of media-related laws in Morocco, Myanmar, & Somalia were amended or adopted by the parliaments in early 2018. In addition, policy and legal frameworks were introduced in Tunisia and Myanmar. Many judges in Latin America and Africa are now incorporating international standards in their court proceedings, while qualified legal assistance to media professionals in Jordan is contributing to the decrease in media self-censorship.

The year 2018 also saw an increased commitment of Member States and the international media community to achieve Goal 16 of the Agenda 2030 on SDGs. The UN Plan of Action on Safety of Journalists and the Issue of Impunity has been strengthened through the re-launching of the UN focal points network, capacity building and the creation of national mechanisms of monitoring, prevention, protection and prosecution. Furthermore, the Internet Universality R.O.A.M principles and indicators have been finalized and UNESCO Member States have agreed for them to be applied at national level to improve media and internet policies in line with international human rights standards.

In Latin America, over 8,000 judges who completed a UNESCO online training course have been empowered to integrate international standards in their decision-making on cases related to access to information or fighting impunity in crimes against journalists, with impact on jurisprudence evident in a number of cases. Schools for judges now incorporate tools developed under a UNESCO project in their curricula for training judges, prosecutors and other judicial operators. The success in Latin America has inspired a similar action in Africa with support from other donors.

The NET-MED Youth project's media component promoted young people's freedom of expression, access to information and representation in media through: i) Youth-focused media research: more than 60 youth from 8 countries acquired media monitoring skills. 5 national surveys, 4 national and a sub-regional media monitoring reports produced; ii) Increased awareness of freedom of expression, access to information and journalists' safety, reinforced media and information literacy, strategic communications and media production capacities by and for youth; through workshops, trainings and events reaching over 1000 beneficiaries including local celebrations of WPFD, IDUAI and IDEI); iii) Production of pedagogical resources, for example to equip youth to counter hate speech and misinformation via enhanced MIL.

As for Media Development Indicators (MDIs), 5 assessments are being conducted in Haiti, Morocco, Jamaica, Guyana, Malawi. In addition, 4 assessments are being finalized in Brazil, Bosnia & Herzegovina, Uganda, Ghana. With regard to Journalists' Safety Indicators (JSIs), one assessment is in progress in South Sudan, and another one is being finalized in Afghanistan. All in all, 11 Member States have been applying the media-related indicators, 4 of them are African countries.

C10. Ethical dimensions of the Information Society (UNESCO)

UNESCO work on Action Line C10 has focused on the ethical dimensions of disruptive technologies, with particular emphasis on big data, robotics and artificial intelligence and their potential for ensuring, through ethical application, the empowerment of citizens and inclusiveness and equality. The

International Bioethics Committee (IBC) and World Commission on the Ethics of Scientific Knowledge and Technology (COMEST) have devoted meetings to all of these topics and consulted broadly with relevant stakeholders to clarify both the nature of the ethical challenges and possible principles that could permit responses to them.

The IBC has completed a [report on big data and health](#), which concludes that, in order to make Big Data a global success for health, to harvest the opportunities of Big Data in health care and research while at the same time avoiding violation of fundamental human rights enshrined in the Universal Declaration of Human Rights and in the Universal Declaration on Bioethics and Human Rights, efforts are required to ensure trust and control. Facing the complex nature, the global scope, and the wide variety of stakeholders involved in Big Data related to health, international cooperation as well as a multi-tiered governance approach are crucial. In this regard, the IBC considers four measures to be central for protecting individual rights and fostering public good while recognizing the unavoidable loss of control by individuals about the use of their data in times of Big Data: governance, education, capacity building, and benefit sharing.

COMEST has completed a [report on robotics](#), which calls for a technology-based ethical framework based on the distinction between fundamentally different categories of robots. Deterministic robots are controlled by a set of algorithms whose actions can be predicted. In considering recommendations regarding robotics ethics, this distinction between deterministic and cognitive robots is important.

The report of COMEST on artificial intelligence has also been completed, in connection with the UNESCO-wide effort to consider how the enormous potential of artificial intelligence for social good and promoting the achievement of the SDGs can be developed in a way that benefits humanity, respects global norms and standards, and is anchored in peace and sustainable development.

In line with action line C7 and C10, UNESCO sought to play in 2018 a leading role in shaping a global debate on artificial intelligence (AI). In the framework of the IGF, **UNESCO organized an Open Discussion on** "[Harnessing Artificial Intelligence to advance Knowledge Societies and achieve Good Governance](#)", in partnership with the Internet Society (ISOC) and the Mozilla Foundation, on November 15th, 2018 in Paris bringing together high-level participants from all geographical areas and stakeholder groups. The event enabled extensive discussions on the impact of emerging technologies and artificial intelligence on media, human rights and access to information and knowledge and highlighted the importance to implement a bottom-up inclusive multi-stakeholder approach and in particular to translate ROAM principles linked to UNESCO's Internet Universality framework to the development of ethical principles linked to artificial intelligence. The open discussion also underlined the key role played by access to information in achieving the SDGs.

In the effort to shape a global debate in all regions of the world on the ethical and societal impacts of artificial intelligence, UNESCO also organized, in partnership with Mohamed VI Polytechnic University, a [Forum on artificial intelligence in Africa](#) from 12 to 13 December 2018 in Benguérir (Morocco). The aim of the Forum was to explore the opportunities and challenges of innovation in emerging technologies and artificial intelligence in Africa, and to enrich the global debate by assessing specific issues arising in the local context. The Forum brought together representatives from Member States and high-level participants from the different stakeholders' groups in an effort to contribute to UNESCO's Priority Africa and implement the SDGs.

C11. International and regional cooperation (UNDESA)

There has been many initiatives in the area of international and regional cooperation to promote universal access and bridging the digital divide since the last annual meeting of the WSIS. While it is not possible to list all initiatives here, one that deserves highlighting is the Secretary-General's High-level Panel on Digital Cooperation which was established by the United Nations Secretary-General António Guterres on 12 July 2018. The Panel was convened to advance proposals to strengthen cooperation in the digital space among Governments, the private sector, civil society, international organizations, academia, the technical community and other relevant stakeholders.

The Panel is drawing on the insights and ideas from stakeholders to draft its final report, which will focus on improving digital cooperation in the following areas: i) Inclusiveness ii)   Digital public goods iii) Implementation of values and principles iv) Governance v) Safety and security and vi) Data. The final report will be released in June 2019.