ITU Contribution to the Implementation of the WSIS Outcomes

2017

Information and Knowledge Societies for Sustainable Development Goals
www.wsis.org

World Summit on the Information Society
Turning targets into action
Geneva 2003 | Tunis 2005 | New York 2015

ITU Contribution to the Implementation of the WSIS Outcomes: 2017

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I. Introduction

Strategic plan for the Union for 2016-2019

1. The implementation of the outcomes of the World Summit on the Information Society (WSIS) continues to be one of the priorities of the Secretary-General of the International Telecommunication Union (ITU). The ITU strategic plan also highlights the use of ICTs to create a positive impact on socio-economic development (as recognized by the outcome texts of the World Summit on the Information Society (WSIS).

2. The UNGA review on the implementation of WSIS resulted in a UNGA Resolution A/70/125 (Outcome Document of the UNGA Overall Review) that was adopted on 16 December 2015. The resolution provides guidance on the implementation of the WSIS Outcomes till 2025. In particular it calls for close alignment between the World Summit on the Information Society process and the 2030 Agenda for Sustainable Development (para.5) and requests all stakeholders to integrate ICTs into their approaches to implementing the Goals, and request UN entities facilitating WSIS Action Lines to review their reporting and work plans to support implementation of the 2030 Agenda (para.12). United Nations entities that are facilitating the World Summit on the Information Society action lines, within their mandate and existing resources, were called upon to continue working together to **regularly analyze the nature of digital divides, study strategies to bridge them, and make their findings available to the international community** (para.23)

The World Summit on the Information Society Forum was recognized "as a platform for discussion and sharing of best practices in the implementation of the World Summit outcomes by all stakeholders, and it should continue to be held annually"(para.69).

In addition, some of the key outcomes of the overall review are listed below:

- We recognize that ending the **gender digital divide** and the achievement of Sustainable Development Goal 5 on gender are mutually reinforcing efforts, and we commit to mainstreaming gender in the World Summit on the Information Society process, including through a **new emphasis on gender in the implementation and monitoring of the action lines**, with the support of relevant United Nations entities, including the United Nations Entity for Gender Equality and the Empowerment of Women (UN-Women), (para.7).

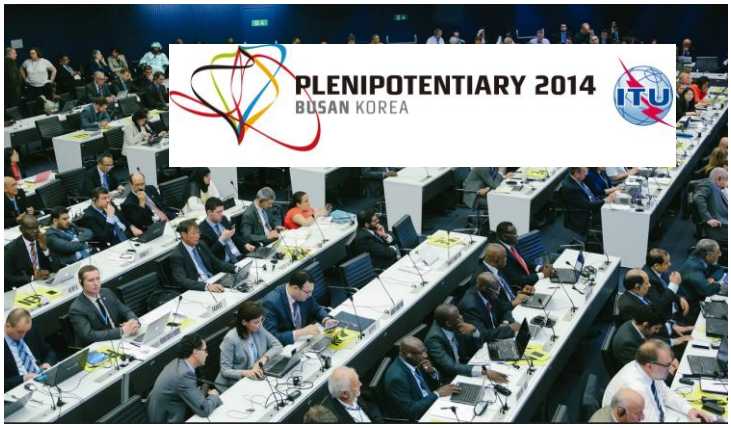
- We recognize that certain policies have substantially contributed to bridging digital divides and the value of information and communications technologies for sustainable development, and we commit to continuing to identify and implement **best and emerging practices** for the establishment and functioning of education, innovation and investment frameworks for information and communications technologies, (para.28).

- We also request the Commission on Science and Technology for Development, within its mandate related to the follow-up to the World Summit on the Information Society, and **all action line facilitators**, within their respective mandates and existing resources, to work with all stakeholders to regularly

identify and promote specific, detailed actions to support the enabling environment for information and communications technologies and development and provide the demand-driven policy advice, technical assistance and capacity-building, as appropriate, to realize them, (para.33).

- We encourage a **prominent profile for information and communications technologies in the new Technology Facilitation Mechanism** established in the Addis Ababa Action Agenda, and consideration of how it can contribute to implementation of the World Summit on the Information Society action lines, (para. 39).
- Regular review of progress of the full set of Summit action lines will be essential to achieving the vision of the Summit, (para.66).
- We also call for the **continuation of the work of the United Nations Group on the Information Society** in coordinating the work of United Nations agencies, according to their mandates and competencies, and we invite the **regional commissions to continue** their work in implementation of the World Summit on the Information Society action lines and their contribution to the reviews thereof, including through regional reviews, (para.68).
- The activities of the **Partnership on Measuring Information and Communications Technology for Development** have made a valuable contribution to data-gathering and dissemination and should be continued, (para.70).

3. At the policy level, following the revision of Resolution 140 (Rev. Busan, 2014), "ITU's role in implementing the outcomes of the World Summit on the Information Society and in the overall review by United Nations General Assembly of their implementation", the ITU Plenipotentiary Conference in 2014 further strengthened the Union's mandate in relation to the implementation of WSIS outcomes.



Revised Resolution 140 provides strategic guidance on ITU's future role in WSIS implementation and follow-up as well as the UNGA Overall Review. Through the resolution 140 the ITU Plenipotentiary Conference resolved to endorse the outcomes of the WSIS+10 High-Level Event, namely: the WSIS+10 Statement on the Implementation of the WSIS Outcomes and WSIS+10 Vision for WSIS beyond 2015. Subsequently, both documents were submitted to the UNGA Overall Review and referenced in its outcome document. According to the resolution, ITU should continue to be the sole facilitator of WSIS Action Lines C2, C5 and C6 and as co-facilitator of the other action lines. It should also continue the coordination of WSIS forums, the World Telecommunication and Information Society Day, WSIS Project Prizes and the maintenance of the WSIS Stocktaking database. The updated resolution also resolved that ITU, in coordination with UNESCO, UNCTAD and UNDP, should contribute to the topic of ICT for development in the debate on the

Development Agenda Beyond 2015 arranged by the United Nations General Assembly, taking into account WSIS+10 High-Level Event (2014) outcome documents; with a focus on bridging the digital divide through sustainable development.

The Resolution 140 (Rev. Busan, 2014) invited Member States inter alia to support, through relevant UN processes, the creation of synergies and institutional linkages between WSIS and the Post-2015 Development Agenda to continue strengthening the impact of ICT for sustainable development. Member States are also invited to contribute and closely collaborate with the Partnership on Measuring the ICT for Development as an international, multistakeholder initiative to improve the availability and quality of ICT data and indicators, particularly in developing countries.

4. Building upon the outcomes of the UNGA overall review, the ITU Council 2016 modified Resolution 1332 and suppressed Resolution 1334 thereby strengthening the ITU's leadership and role in the WSIS Process till 2025.

5. The ITU Council 2016, resolved that ITU should play a leading facilitating role in the WSIS implementation process, along with UNESCO and UNDP, as stated in § 109 of the Tunis Agenda, that ITU should continue to coordinate WSIS Forums, World Telecommunication and Information Society Day (WTISD) and WSIS Project Prizes and maintain the WSIS Stocktaking database, as well as continue to coordinate and support the activities of the Partnership for Measuring ICT for Development. Council also resolved to use the WSIS framework as the foundation through which the ITU helps achieve the 2030 Agenda, within the ITU's mandate and within the allocated resources in the financial plan and biennial budget, noting the WSIS-SDG Matrix developed by UN Agencies, working through the Council Working Group on WSIS. In addition, the Terms of Reference of the WG-WSIS, annex to the Council Resolution 1332, was altered to include the 2030 Agenda for Sustainable Development, in particular monitoring and evaluation on a yearly basis the actions taken by ITU with respect to implementation of WSIS outcomes and the 2030 Agenda for Sustainable Development.

6. The Council Working Group (CWG) on WSIS, created in 2002, continues to monitor and evaluate on a yearly basis the actions taken by ITU with respect to implementation of WSIS outcomes. The CWG facilitates inputs from membership on the ITU implementation of relevant WSIS outcomes through its regular meetings and circular letters, questionnaires or other appropriate methods of query and provides guidance to the membership regarding the actions to be performed by ITU in the implementation of WSIS outcomes.

7. A Council Working Group (CWG) on Internet related public policy issues was established as a separate group by Council Resolution 1336, in accordance with Resolutions 102 and 140 of the 2010 Plenipotentiary Conference. This CWG is limited to Member States, with open consultation to all stakeholders. Previously, this group was established as the Dedicated Group as an integral part of WG WSIS, open only to all Member States, in accordance with Resolution 75 (WTSA, 2008), and Council Resolution 1282 (Mod. 2008). Council 2012 Resolution 1344, modified 2015, decided the modality of the open consultation for the Group. 2009 Council Resolution 1305 invites Member States to recognize the scope of work of ITU on international Internet-related public policy matters, represented by the list of

topics in Annex 1 which was established in accordance with decisions of ITU membership at the Plenipotentiary Conference, Council and world conferences; and to elaborate their respective position on each of the international Internet-related public policy issues referenced in the list of topics and to contribute actively to the work of ITU on these issues.

8. The three Sectors of the Union (Standardization, Radiocommunication and the Development Sector) and the General Secretariat have carried out several important activities and projects that enhance the WSIS outcomes and objectives.

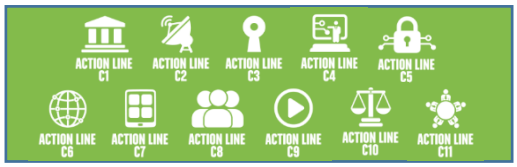
9. At the operational level, ITU has been carrying out the tasks assigned by the WSIS Outcomes Documents, in particular, in its capacity as:

- Lead facilitator (along with UNESCO and UNDP) in coordinating the multistakeholder implementation of the *Geneva Plan of Action*.
- Facilitator of Action Lines C2 (Information and communication infrastructure) and C5 (Building confidence and security in the use of ICTs); upon the UNDP's request the ITU accepted to play the role of the Facilitator of Action Line C6 (Enabling Environment).
- Co-facilitator of Action Lines C1, C3, C4, C7 and C11; and partner for C8 and C9.
- Rotating chair of the United Nations Group on Information Society (UNGIS).
- Steering committee member of the Partnership on Measuring ICT for Measurement.
- Facilitator of the WSIS Stocktaking process.
- Initiator and facilitator of the WSIS Project Prize
- Implementation of other WSIS outcomes.

10. Within the ITU, the effective coordination of ITU's strategies and activities in relation to WSIS has been ensured by a WSIS Task Force that is chaired by the Deputy Secretary-General. Taking into account resolves of Resolution 1332, the terms of reference of the WSIS Task Force have been amended incorporating coordination on the activities of ITU related to SDGs.

11. This document is divided into six sections. Following the introduction, the second section highlights the alignment between the WSIS Action Lines and the 2030 Agenda for Sustainable Development. The third section provides an overview of ITU activities and projects undertaken in 2017 in the context of the implementation of WSIS Outcomes, while the fourth section informs about ITUs Role in the Overall Review of the Implementation of the Outcomes of the World Summit on the Information Society. The fifth section highlights forums, innovative initiatives and informs about the planned future activities to ensure the full implementation of the WSIS outcomes. The final section provides conclusions of the report.

II. WSIS Action Lines and the 2030 Agenda for Sustainable Development



12. The UNGA Resolution A/70/1 on Transforming Our World: the 2030 Agenda for Sustainable Development was adopted in 2015. This Agenda is a plan of action for people, planet and prosperity. It also seeks to strengthen universal peace in larger freedom. It recognizes that eradicating poverty in all its forms and dimensions, including extreme poverty, is the greatest global challenge and an indispensable requirement for sustainable development.

13. The vital role of ICTs as a catalyst for development is specifically recognized in the new development framework of the 2030 Agenda, which acknowledges that "the spread of information and communication technology and global interconnectedness has great potential to accelerate human progress and to develop knowledge societies, to bridge the digital divide and to develop knowledge societies, as does scientific and technological innovation across areas as diverse as medicine and energy"

    The UNGA overall review on the implementation of WSIS resulted in a UNGA Resolution A/70/125 that was adopted on 16 December 2015. The resolution provides guidance on the implementation of the WSIS Outcomes till 2025. In particular it calls for close alignment between the WSIS process and the 2030 Agenda for Sustainable Development (para.5) and requests all stakeholders to integrate ICTs into their approaches to implementing the Goals, and request UN entities facilitating WSIS Action Lines to review their reporting and work plans to support implementation of the 2030 Agenda, (para.12). ICTs are identified as targets in the SDGs for education, gender equality, infrastructure (universal and affordable access to the internet) and in the implementation goal as a cross cutting tool to be utilized for the achievement of all of the SDGs. The effective implementation of the WSIS Action Lines can help accelerate the achievement of the SDGs. To that end, the WSIS SDGs Matrix, developed by the UN Action line Facilitators, clearly shows the linkage between each Action line and the 17 SDGs and provides rationale for each. Please see paras. 19-25 below.

14. ICTs empower billions of individuals around the world with wide ranging applications cutting across sectoral boundaries in agricultural productivity; population, health and education; transportation; industry, trade and finance; climate change and protection of our environment; as well as for the prevention and management of disasters, among many others.

15. The new post-2015 development agenda, "Transforming our World: The 2030 Agenda for Sustainable Development" was adopted at the UN General Assembly Summit held from 25-27 September 2015. The agenda has four sections: a Preamble and Declaration, Goals and Targets, Means of Implementation and Global Partnerships, and Follow-up and Review.

16. The Declaration, section "Our world today," addresses key challenges and opportunities to the existing inequalities within and among countries. It also recognizes that "the spread of information and communication technology and global interconnectedness has great potential to accelerate human progress, to bridge the digital divide and to develop knowledge societies, as does scientific and technological innovation across areas as diverse as medicine and energy" (para. 15).

17. The SDGs contain 17 goals and 169 targets and are intended to be action-oriented, concise and easy to communicate, limited in number, aspirational, global in nature and universally applicable to all countries, and focused on priority areas for the achievement of sustainable development; Equally important is the need to assess progress towards the achievement of the goals, accompanied by targets and indicators, while taking into account different national circumstances, capacities and levels of development.

18. Four targets of the SDGs explicitly recognize the role of ICTs. This applies to the targets on Education and Scholarships (4.b) on Gender Empowerment (5.b) on Infrastructure for Universal and Affordable access to ICTs and the Internet in the Least Developed Countries (9.c) and more broadly, Goal 17 on Strengthen the means of implementation and revitalizing the global partnership for Sustainable Development, which calls to enhance the use of enabling technology, in particular ICTs. There are also several references to technology in general throughout the SDGs in which ICTs play an important direct or indirect role.

19. The Agenda notes that the Means of Implementation (MOI) targets under each SDG and Goal 17 are key to realizing the agenda and of equal importance with other Goals and targets. Science, Technology (in particular ICTs), Innovation, the Technology Bank, and new technology facilitation mechanism are called to play a relevant role as MOI's in achieving the SDGs.

20. The **2017 High Level Political Forum (HLPF**), convened under the auspices of the Economic and Social Council, was held from 10-20 July, 2017, at the United Nations Headquarters in New York. The HLPF is the central UN platform for the follow-up and review of the 2030

Agenda for Sustainable Development and the Sustainable Development Goals (SDGs) adopted in 2015. The event held over 8 days, was attended by 77 Ministers, Cabinet Secretaries and Deputy Ministers, 2458 registered stakeholder representatives, and included 36 sessions, 3 special events and over 147 side events.

21. The 2017 edition of the HLPF, held under the theme of "Eradicating poverty and promoting prosperity in a changing world", reviewed in depth: Goal 1 (no poverty); Goal 2 (zero hunger); Goal 3 (good health and well-being); Goal 5 (gender equality); Goal 9 (industry, innovation and infrastructure); Goal 14 (life below water) and Goal 17, on means of implementation and partnerships, and included a high-level Ministerial segment, a General Debate and the presentation of the following 43[1] Voluntary National Reviews (VNRs) on the implementation of the 2030 Agenda.

22. Three dedicated sessions were also programmed around this year's theme on the following:
    - "Eradicating Poverty and promoting prosperity in a changing world-taking forward the SAMOA Pathway"
    - "Leveraging interlinkages for effective implementation of SDGs"
    - "Eradicating Poverty and promoting prosperity in a changing world- how it affects countries in special situations: LDCs and LLDCs"

23. The need to harness technology, including ICTs, as a key driver was stressed in most sessions, in particular during the Voluntary National Reviews (VNRs) which featured ICTs more prominently this year. The majority of the 43 countries presenting their reports made references in their full reports or orally in various areas, not only to demonstrate how ICTs cut across issues, but how they are increasingly relying on ICTs to accelerate the implementation of the SDGs. A non-exhaustive examples of references as follow: Digital literacy (e.g., India, Italy); smart cities (e.g., Benin, Brazil, Sweden; Thailand), digital infrastructure (e.g., Luxembourg, Maldives, Togo), cybersecurity (e.g., Belgium, Slovenia), digital entrepreneurship (e.g., Cyprus, Malaysia), data collection (e.g., Malaysia, Qatar), health (e.g., Botswana, Zimbabwe), youth (e.g., Nigeria), agriculture (e.g., Togo), gender (e.g., Azerbaijan; Bangladesh, Belgium, Costa Rica, Chile, India, Indonesia, Luxembourg, Nigeria); financial inclusion (e.g., Bangladesh, Kenya, Maldives).

24. A number of countries outlined the need for multi-stakeholder partnerships in their VNRs to help transition to a digital future (e.g., Botswana, Indonesia, Sweden, Thailand; Turkey), implementing measures to attract private investment (e.g., Bangladesh, Portugal). Others have made digital tools an integral part of their development cooperation strategies, be it trying to facilitate Internet access in least developed countries (Monaco) or designing gender-based projects in war-torn regions (Belgium). Countries like Costa Rica, Brazil, India, Maldives and Tajikistan emphasized the need to reach people living in remote regions, while Bangladesh, Ethiopia, Indonesia and Thailand to reduce differences between communities in urban and rural areas. Digital inclusion of the population has become a priority for Malaysia, Portugal and Uruguay. Some countries like Botswana, made clear

[1] Originally programmed 44 countries (Iran did note present its VNR).

that inadequate ICT infrastructure is "a significant impediment to economic growth and poverty alleviation".

25. The main outcome of the HLPF was the Joint Ministerial Declaration of the HLPF and ECOSOC High-level Segment, adopted as a whole, without a vote[2], which addresses a number of 2030 Agenda-related issues, touching upon the 17 Goals. The Declaration recognizes the role that infrastructure, industry and innovation could play in transforming and improving the quality of life for millions. Of particular interest paragraphs 18 and 22 underline the fact that more than half of the world's population is still offline and the poor access to infrastructure, including information and communications technology, and emphasizes that the spread of information and communications technology and global interconnectedness has great potential to accelerate human progress, to bridge the digital divide, including the gender digital divide, and to develop knowledge societies, as does scientific and technological innovation across diverse areas. The Declaration also recognizes that the creation, development and diffusion of innovations and new technologies and associated know-how are powerful drivers of economic growth and sustainable development, and acknowledges both the transformative and disruptive potential of new technologies.

26. **Update on ITU input to and activities at the High Level Political Forum 2017**

Inputs:

- ITU's main input to the HLPF consisted of the ITU Council contribution to the 2017 HLPF;
- In addition, the ITU coordinated report "Fast-Forward Progress: Leveraging Tech to Achieve the Global Goals", a collective effort of the UN system to articulate how ICTs are being applied to achieve the 17 Goals, was presented as a contribution to this year's HLPF, officially launched on the 13 of July 2017 in Geneva and New York;
- ITU Secretary-General and UN Women Executive Director joint letter of 1 May 2017, addressed to the 44 Member States presenting VNRs, encouraging to highlight in the reports the important role of ICTs in developing both gender equality and gender empowerment, policy measures, including universal service funds, that the countries have undertaken to bridge the gender divide.
- The outcomes of the WSIS Forum 2017, were also submitted to the President of ECOSOC as input to the HLPF, including the action-oriented partnership with UNIDO, that aims to build coalitions and drive collaboration that will help accelerate the advancement of SDG9 of the 2030 Agenda;
- ITU also contributed by means of the following inter-agency activity:
    - Thematic background notes provided by members of Executive Committee on Economic and Social Affairs (ECESA Plus) as a coordinated contribution by the UN system to the 2017 HLPF:

[2] Prior to adopting the Declaration, the Forum decided, by separate recorded vote, to retain two paragraphs. (By a recorded vote of 104 in favour to 8 against with 48 abstentions, the Forum decided to retain paragraph 4, which called for further effective measures and actions to remove the obstacles to full realization of the right of self-determination of peoples living under colonial and foreign occupation, which continued to adversely affect their economic and social development and their environment; With 112 in favour, 1 against, and with 46 abstentions, the Forum decided to retain paragraph 21. That paragraph stated that efforts would continue to promote a universal, rules-based, open, transparent, predictable, inclusive, non-discriminatory and equitable multilateral trading system under the World Trade Organization as well as meaningful trade liberalization).

- 2017 HLFP Thematic Review of SDG 1: End Poverty in All its Forms Everywhere
- 2017 HLFP Thematic Review of SDG 2: End hunger, achieve food security and improved nutrition, and promote sustainable agriculture
- 2017 HLFP Thematic Review of SDG 3: Ensure healthy lives and promote well-being for all at all ages
- 2017 HLFP Thematic Review of SDG 5: Achieve gender equality and empower all women and girls
- 2017 HLFP Thematic Review of SDG 9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation (co-lead by ITU, WIPO, UNCTAD, UNIDO and the World Bank)
- 2017 HLFP Thematic Review of SDG 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development

- "Thematic review of the SDGs at HLPF: Input of cross-cutting issue of information and communication technologies (ICT) for development" by the Partnership on Measuring ICT for Development;
- Financing for Development: Progress and Prospects, Report of the Inter-agency Task Force on Financing for Development 2017;
- Outcome document of the Multi-stakeholder forum on science, technology and innovation for the Sustainable Development Goals (STI-Forum held annually), where ITU contributed to the discussions and organized a side event on Innovation strategies: Designing national policies that use innovation to meet the SDGs, together with UNCTAD, WIPO and the World Bank, as well as a speaker at side event organized by Finland and UNIDO on the "Implications of Technology and Innovation for the future of Manufacturing".

- An Open Letter from the Broadband Commission for Sustainable Development to the 2017 HLPF was also submitted to the United Nations Secretary-General and the President of ECOSOC.

Statements:

ITU provided oral and written statements under agenda items covering the reviews of Goal 5, Goal 9 and Goal 17 during the deliberations, highlighting the role of ICTs as an enabling tool to meet the respective goal. ITU delivered its main statement on behalf of the Secretary-General during the General Debate to reaffirm its commitment to leverage the power of ICTs to fast-forward progress on the SDGs and to work with all to eradicate poverty and promote prosperity in today's changing world. The statement also highlights and takes note of the increased emphasis on ICTs in this year's VNRs.

27. **Special events and side events with ITU collaboration:**

- ITU organized the side event: "ICT for sustainable development- How digital solutions can drive progress towards the SDGs" held on 13 July, with the participation of ITU, GeSI, Nokia (Broadband Commission for Sustainable Development WG on Digital Health), UNIDO and Bangladesh. The event was attended by over 60 participants and served to launch the ITU "Fast Forward Progress: Leveraging Tech to Achieve the Global Goals".
- ITU was invited to participate in the Partnership Exchange Special Event held on 17 July to announce the EQUALS: Global Partnership for Gender Equality in the Digital Age;
- ITU was a co-organizer of the side event "High-Level Panel Discussion on ICTs and Poverty Eradication", held on 17 July, together with Vietnam, Italy, Bangladesh, Zimbabwe and UNDP

- ITU was invited as a panellist in the side event "Accelerating Women's Economic Empowerment to Achieve the 2030 Agenda" held on 17, hosted by UN Women, ICC, Costa Rica and UK side event (17 July, 13:15-14:30).
- ITU organized a working meeting of focal points of the partners for Equals on 18 July, with over 50 participants attending from the hub in NY (held in WIPO), the hub in ITU Geneva, and several others joined remotely. ITU SG joined the meeting at the closing to thank all members to their support to bridge the growing digital gender gap.

28. **Other side events where ITU participated:**

- "Science- technology- innovation: Closing the gender gap to meet the SDGs" hosted by WIPO, UNESCO and UN WOMEN, held on 12 July;
- "G-STIC 2017: the first in a series of Global Science, Technology & Innovation Conferences" hosted by Belgium and G-STIC -VITO Flemish Institute for Technological Research, held on 12 July;
- "Eradicating Poverty and Promoting Prosperity in a Changing World: the use of space-based technologies and applications for Sustainable Development" hosted Austria, UNOOSA and Ethiopia, held on 18 July;
- Locals2030: Hub for Sustainability Solutions special event where a presentation of KPI's of the United for Smart Sustainable Cities (U4SSC) initiative was made by Kari Aina EIK / John Smiciklas, Chairman of the working group on key performance indicators;
- "The SDGs in Action – Eradicating poverty & promoting inclusive prosperity in a changing world" organized under the aegis of the Sustainable Development and Sustaining Peace Results Group, co-chaired by UNDP and PBSO, held on 18 July;
- "ICT Integrated Innovative Education for Global Citizenship to Eliminate Poverty", organized by the Baha'I International, held on 19 July.

29. **ITU activities towards High Level Political Forum 2018:** ITU will continue to provide inputs and participate actively during the 2018 HLPF with similar contributions as in 2017. The 2018 HLPF will be convened under the theme "**Transformation towards sustainable and resilient societies**" and will provide the opportunity to focus on the following SDGs:

Goal 6: Ensure availability and sustainable management of water and sanitation for all

Goal 7: Ensure access to affordable, reliable, sustainable and modern energy for all

Goal 11: Make cities and human settlements inclusive, safe, resilient and sustainable

Goal 12: Ensure sustainable consumption and production patterns

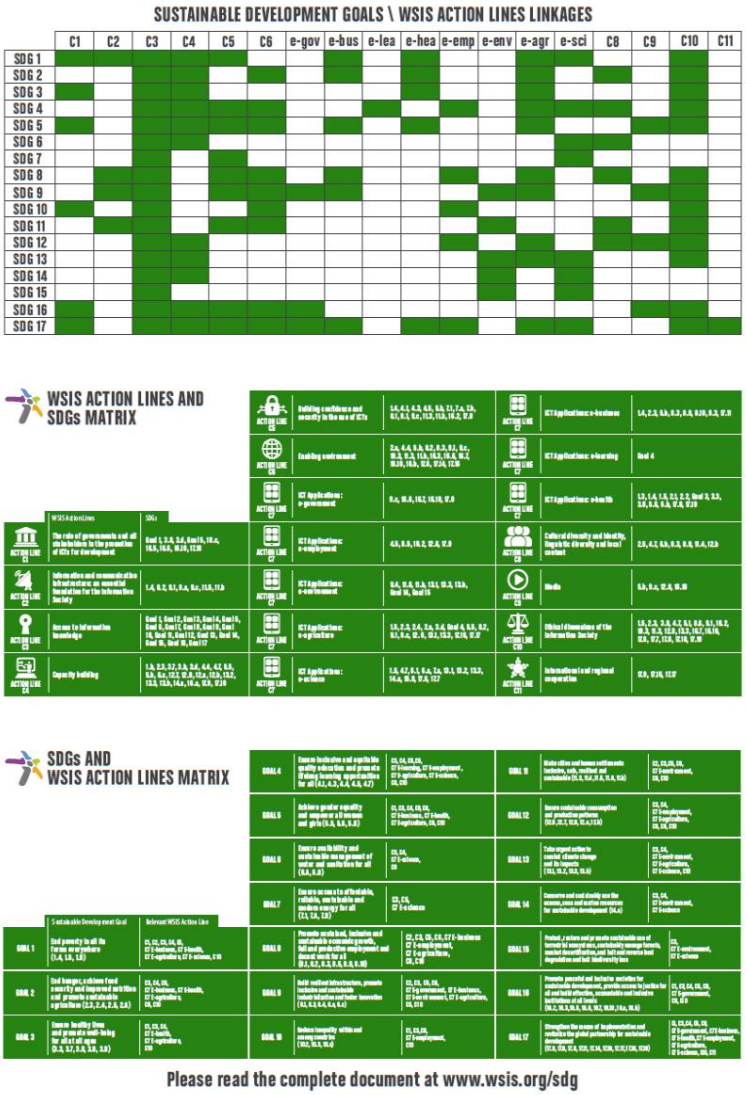
Goal 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

Goal 17: Strengthen the means of implementation and revitalize the global partnership for sustainable development (reviewed annually)

(a) WSIS Action Lines and SDG Matrix

30. At the WSIS Forum 2015, ITU coordinated the **WSIS Action Lines and SDG matrix**, a new tool developed by a number of United Nations agencies to map how ICTs may contribute to the implementation of the new SDGs. The Matrix will serve as an easy reference for stakeholders engaged in shaping the future of both, the SDGs and the WSIS processes beyond 2015 and the 2030 Agenda for Sustainable Development.

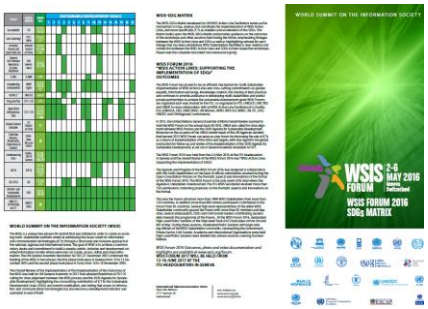
31. The mapping exercise draws direct linkages of the WSIS Action Lines with the proposed SDGs to continue strengthening the impact of Information and Communication Technologies (ICTs) for sustainable development. Each UN Action Line Facilitator has analyzed the connections and relations of their respective Action Line with the proposed SDGs and their targets. This is a living document and changes can be introduced by Action Line Facilitators, if needed.



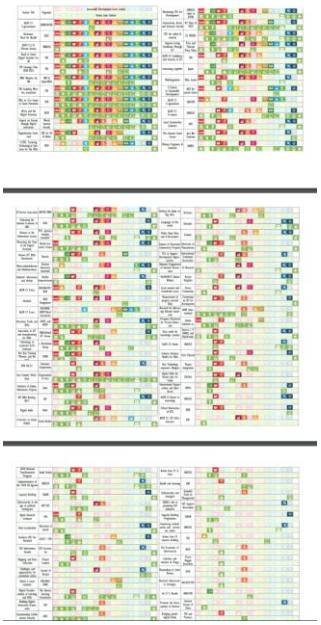
32. The goal is to create a clear and direct link and an explicit connection between the key aim of the WSIS, that of harnessing the potential of ICTs to promote and realize the development goals, and the post 2015 development agenda, so as to contribute to the realisation of the latter.

33. The WSIS Forum continues to evolve and adapt, by strengthening the synergies between the WSIS Action Lines and SDGs, and taking into account the outcomes of the UNGA Overall Review. In this regard, the WSIS Forum 2016 was entitled WSIS Action lines: Supporting the Implementation of the SDGs, please read more at www.wsis.org/sdgs

34. One of the Outcomes of WSIS Forum 2016 was the WSIS Action lines and SDGs Matrix This document builds upon the WSIS-SDG Matrix and provides guidance on the outcomes of more than 100 sessions held during the forum, emphasizing linkages between the WSIS Action Lines and SDGs as well as highlighting rational for each linkage that has been established, please see at www.wsis.org/forum .



35. **WSIS Forum 2017 Matrix :** The WSIS-SDG Matrix developed by UN WSIS Action Line Facilitators serves as the mechanism to map, analyze and coordinate the implementation of WSIS Action Lines, and more specifically, ICTs as enablers and accelerators of the SDGs. This Matrix builds upon the WSIS-SDG Matrix and provides guidance on the outcomes of the workshops and other sessions held during the forum, emphasizing linkages between the WSIS Action Lines and SDGs as well as highlighting rational for each linkage that has been established. WSIS Stakeholders identified a clear relation and connection between the WSIS Action Lines and SDGs in their respective workshops. Please read the complete document here: https://www.itu.int/net4/wsis/forum/2017/#outcomes



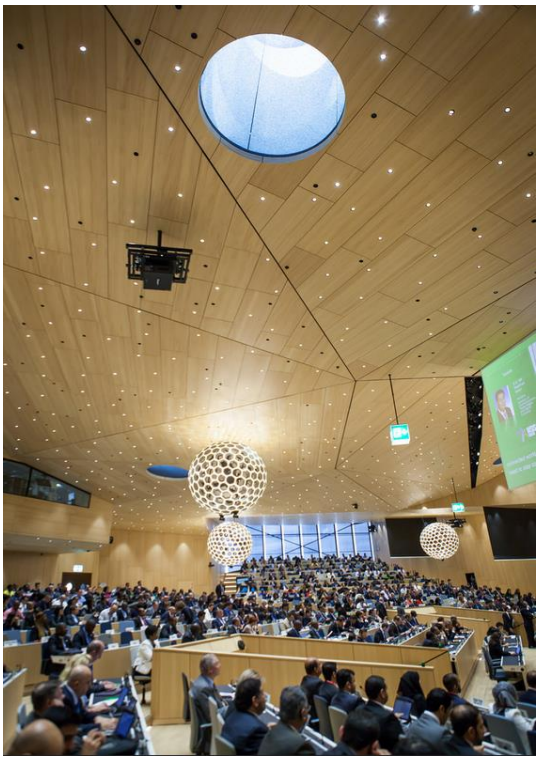
36. In response to the call by the UN General Assembly within the framework of the ten year review of the WSIS (Res. A/70/125) calling for a close alignment between the WSIS process and the 2030 Agenda for Sustainable Development, the **WSIS Stocktaking process** highlighted the contribution of 11 WSIS Action Lines to the achievement of 17 Sustainable Development Goals (SDGs).

37. In this regard, the **WSIS Prize 2017** contest aligned its rules to highlight the linkage between the WSIS Action lines and SDGs, this approach will be strengthened in 2018.

III. Overview of ITU activities and projects undertaken since 2017 in the context of the implementation of WSIS Outcomes, also related to the 2030 agenda for Sustainable Development

(a) Lead facilitator (along with UNESCO and UNDP) in organizing the multistakeholder implementation of the *Geneva Plan of Action*.

38. Since 2006, ITU (along with UNESCO and UNDP) has played a leading facilitating role in the implementation of the Geneva Plan of Action (para 109 of the Tunis Agenda). At the international level the cluster of the WSIS related Meetings held every May from 2006 to 2008, and the WSIS Forum has been held every year since 2009. In 2015, the UNGA resolution A/70/125 recognized the WSIS Forum as a platform for discussion and sharing of best practices in the implementation of the World Summit outcomes by all stakeholders, and stated that it should continue to be held annually.



39. At the regional level the Regional Commissions have played a key role in the implementation of the Geneva Plan of Action and reported at the WSIS Forum globally.

40. The ITU has planned, organized and hosted the WSIS Forum since 2009 in collaboration with the co-organizers, UNESCO, UNCTAD and UNDP. The annual WSIS Forum is a global

multistakeholder platform facilitating the implementation of the WSIS Action Lines. The Forum, co-organized by ITU, UNESCO, UNDP and UNCTAD, in close collaboration with all WSIS Action Line co-/facilitators and other UN organizations (UNDESA, FAO, UNEP, WHO, UN Women, WIPO, WFP, ILO, WMO, ITC, UPU, UNODC, UNICEF and UN Regional Commissions), is also an opportunity for information exchange, knowledge creation and sharing of best practices, taking into account the evolving Information and Knowledge Societies. The WSIS Forum provides opportunities for developing multistakeholder and public-private partnerships to advance development goals.

41. The WSIS Forum is a natural evolution of the Cluster of the WSIS related Meetings held every May from 2006 to 2008 organized by the WSIS Action Line facilitations and coordinated by ITU. Since 2009, the WSIS Forum itself has evolved into a unique platform for multistakeholder consensus and discussions on crucial issues concerning the information society. The WSIS Forum results in several documents in particular the WSIS Forum Outcome Document is released on the last day of the Event each year. The agenda, programme and format of the Forum is built in an open multistakeholder consultation process that consists of physical meetings and online consultations. The Forum comprises of a high-level and forum track that include high-level panels, WSIS Action Lines meetings, WSIS Action Line Facilitator's meeting, thematic workshops, and various platforms for networking and initiation of partnerships.

42. Please refer to the following for the yearly editions of the WSIS Forum, you can also find the Outcome Documents and the Emerging Trends Document:

- **Cluster of WSIS Related Events 2006:**

  http://www.itu.int/net/wsis/implementation/cluster.asp?year=2006&month=0&type='alf'&subtype=0

- **Cluster of WSIS Related Events 2007:**

  http://www.itu.int/net/wsis/implementation/cluster.asp?year=2007&month=0&type='alf'&subtype=0

- **Cluster of WSIS Related Events 2008 :**

  http://www.itu.int/net/wsis/implementation/cluster.asp?year=2008&month=0&type='alf'&subtype=0

- **WSIS Forum 2009:**

  http://www.itu.int/wsis/implementation/2009/forum/geneva/

- **WSIS Forum 2010**:

  http://www.itu.int/wsis/implementation/2010/forum/geneva/

- **WSIS Forum 2011**:

  http://www.itu.int/wsis/implementation/2011/forum/

- **WSIS Forum 2012**:

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- **WSIS Forum 2013**:
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- **WSIS Forum 2014**:
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- **WSIS Forum 2015**:
  http://www.itu.int/wsis/implementation/2015/forum/
- **WSIS Forum 2016:**
  http://www.itu.int/wsis/implementation/2016/forum/
- **WSIS Forum 2017:**
  http://www.itu.int/net4/wsis/forum/2017/

43. At the regional level, each year the regional commissions report on their actions at the annual WSIS-Regional Commissions meeting held at the WSIS Forum. In follow up to the UNGA resolution A/70/125 that invites the regional commissions to continue their work in implementation of the World Summit on the Information Society action lines and their contribution to the reviews thereof, including through regional reviews, the regional commissions in collaboration with ITU, UNESCO and UNDP, organizes regional WSIS Implementation Workshops. The objectives of these workshops are:

- Building regional capacity on the WSIS Implementation process and its alignment with 2030 Agenda
- Building awareness on the enabling role of ICTs in sustainable development towards programming of future UNDAFs
- Contributing as regional formal submission to the WSIS Forum Open Consultation Process bringing the regional emerging trends, challenges and opportunities to the global dialogue on WSIS implementation
- Regional reporting on projects to the WSIS Stocktaking
- Identification of possible projects for submission to the WSIS Prize competition
- Regional inputs to the WSIS Action Line facilitation process

44. WSIS Forum 2017 was held from the 12-16 June at the ITU Headquarters, Geneva, Switzerland. This year the Forum attracted more than 2000 WSIS Stakeholders from more than 150 countries. Thousands followed remotely while more than 500 were engaged by intervening remotely. More than 500 high-level representatives of the wider WSIS Stakeholder community graced the Forum with more than 85 ministers and deputies, several ambassadors, CEOs and Civil Society leaders contributing passionately towards the programme of the Forum. Building on the outcomes of the multistakeholder open consultation process, over 200 content rich workshops were organized clearly showcasing the linkages between the WSIS Action lines and SDGs. In addition, 18 WSIS Prizes winners and 70 WSIS Prizes champions were acknowledged for their excellent work in implementation of the WSIS Action Lines on the ground.

45. The Chairman of the WSIS Forum 2017 was H.E. Mr. Jean Philbert Nsengimana, Minister of Youth and ICT, Rwanda. The high-level policy sessions were moderated 14 by High-Level Track Facilitators nominated and identified by the different WSIS Stakeholders types https://www.itu.int/net4/wsis/forum/2017/#highlevel.

46. With the objective of strengthening the alignment of WSIS and SDG processes, the overall theme for WSIS Forum 2017 was Information and Knowledge Societies for SDGs. In particular, in order to highlight the contribution of the WSIS Action Lines in accelerating the achievement of the SDGs, the ITU coordinated, with the UN Action Line Facilitators, UNDESA, UNESCO, UNCTAD, ITU, UPU, WHO, ILO, WMO, UNEP, a document that focuses on the impact of the respective Action Lines on the HLPF 2017 theme "Eradicating poverty and promoting prosperity in a changing world". It further seeks to encourage and promote effective multistakeholder cooperation in implementation of WSIS Action Lines and the SDGs. The report is available here: https://www.itu.int/net4/wsis/forum/2017/#outcomes

47. WSIS Forum 2017 resulted in several concrete outcomes that will enable stakeholders to strengthen implementation of WSIS Action Lines and the alignment of the WSIS and SDG processes https://www.itu.int/net4/wsis/forum/2017/#outcomes :WSIS Forum 2017 Outcome Document: http://www.itu.int/en/itu-wsis/Documents/wf17/WSISForum2017_ForumTrackOutcomes.pdf

    47.1. WSIS Forum 2017 Outcomes linked to WSIS Action Lines SDGs Sustainable Development Goals - Matrix Flyer: http://www.itu.int/en/itu-wsis/Documents/wf17/WSISForum2017_WSIS-SDGsMatrix_F.pdf
    47.2. WSIS Forum 2017 High Level Track Outcomes and Executive Brief: http://www.itu.int/en/itu-wsis/Documents/wf17/WSISForum2017_HighLevelTrackOutcomesStatements.pdf
    47.3. WSIS Forum 2017: WSIS Action Lines—SDGs Heatmap: Building on the WSIS-SDG Matrix developed by UN WSIS Action Line Facilitators, a mapping tool was made available to emphasize the linkages between the Action Lines and the SDGs identified by WSIS Stakeholders in their respective sessions and workshops: https://www.itu.int/net4/wsis/forum/2017/Agenda/#heatmap
    47.4. WSIS Stocktaking Report 2017: http://www.itu.int/pub/S-POL-WSIS.REP-2017
    47.5. WSIS Stocktaking Success Stories 2017: http://www.itu.int/pub/S-POL-WSIS.SUCC_STORIES-2017
    47.6. WSIS Forum 2017: Report – Implementation of WSIS Action lines for Eradicating poverty and promoting prosperity in a changing world: http://www.itu.int/en/itu-wsis/Documents/wf17/WSISActionLinesSupportingImplementationOfSDGs-WSISForum2017.pdf
    47.7. A Special SDG9 Session was co-hosted by ITU and United Nations Industrial Development Organization (UNIDO) during the WSIS Forum 2017 and explored a variety of themes linked with SDG9 to ensure collaborative action in achieving SDG9 (Industry, Innovation and Infrastructure) (read outcomes here: http://www.itu.int/en/itu-wsis/Documents/wf17/WSISForum2017_ForumTrackOutcomes.pdf)

- **Photographs:** https://www.flickr.com/photos/itupictures/albums/
- **Videos, Interviews and Highlights**: https://www.youtube.com/playlist?list=PLpoIPNlF8P2NR-mXRzpmOx8_hIs_sf0wh

All WSIS Forum 2017 Outcomes, photos and videos documentation and highlights are available at www.wsis.org/forum.

48. The **WSIS Forum 2018** is scheduled to be held from the **19-23 March** at the ITU Headquarters, Geneva. The agenda and programme will build upon the Open Consultation Process, structured in six phases, for further information please visit www.wsis.org/forum

49. The Open Consultation Process for the WSIS Forum 2018 is structured in five phases as follows:
    - **Phase I: 19 September 2017**: 17:00 – 18:00: Launch of the Open Consultations (Face-to-face meeting during the WG-WSIS)
        - Launch of the WSIS Forum 2018 Website for the Official Submissions
        - Online discussions at Online Knowledge Societies Platform
        - Official submissions to the WSIS Secretariat on the Thematic Aspects and Innovations on the Format to be made via www.wsis.org/forum
        - Open call for nominations for WSIS Forum 2018 Multi-stakeholder High-Level Track Facilitators
        - Launch of the WSIS Photo Contest 2018
    - **Phase II: 20 December 2017**: 1st Physical Meeting: Open Forum on Implementation of WSIS Action Lines and WSIS Forum (during IGF)
    - **Phase III: 24 January 2018**: 16:30 – 18:00: 2nd Physical Meeting (ITU Headquarters, Geneva)
    - **Phase IV: 30 January 2018 -** Deadline for Submissions of Official Contributions and Binding Requests for Workshops
    - **Phase V**: **19 February 2018:** Final Brief on the WSIS Forum 2018 (ITU Headquarters, Geneva)

(b) Facilitator of the WSIS Action Lines C2, C5, C6

Action Line C2: Information and Communication Infrastructure, (also related to the 2030 Agenda for Sustainable Development)

Related to the SDGs: SDG 1 (1.4), SDG 8 (8.2), SDG 9 (9.1, 9.a, 9.c), SDG 11 (11.5, 11.b)

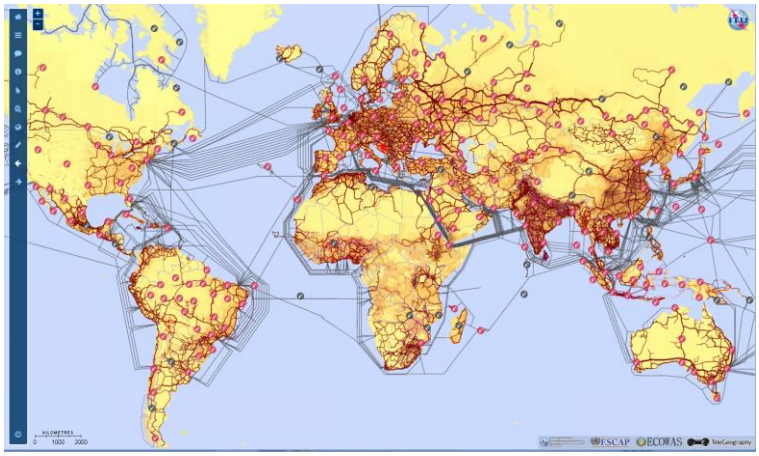
50. Within the framework of the existing resources and given mandate, as well as in line with the Geneva Action Plan, the ITU carries out several activities with regard to the WSIS Action Line C2. ITU plans and activities are taking into consideration the approved Resolution 70/1 (Transforming our world: the 2030 Agenda for Sustainable Development) where it was recognized that high-speed broadband is an essential enabler of sustainable development. Another relevant tool is the WSIS-SDG Matrix developed by UN WSIS Action line Facilitators, serving as a mechanism to map, analyze and coordinate the use of ICTs as catalysts for the implementation of the SDGs.

51. The 12th Action line C2 Facilitation Meeting was held in Geneva on Thursday 15 June 2017 as an integral part of the WSIS Forum 2017. Based on proposals received during the WSIS Forum 2017 multistakeholder open consultation process, the theme for the Action Line Facilitation meeting was: Information and Communication Infrastructure: Building the Foundation for an Inclusive Information Society. Among the debated issues, participants discussed: The next ICT Infrastructure to connect the unconnected; Interoperability and conformity to international standards, spectrum free of harmful interference, and IoT readiness; Smart Cities to create sustainable cities and communities; Infrastructure as an essential enabler and the growing digital divide both between and within countries; Broadcasting developments; among others. Please find the outcome of the meeting here: https://www.itu.int/en/itu-wsis/ Documents/wf17/ WSISForum2017 ForumTrackOutcomes.pdf

52. Having in mind the Goal 9 "Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation" the Action Line C2 Facilitators organized a Thematic Workshop on "Targeting SDG Goal 9: Identifying development Gaps to infrastructure placement and search for opportunities". The workshop considered: 1) Resources for achieving the SDGs: Microwaves, satellite earth stations, optical fibers, IXPs, Broadband, spectrum management, database on Orbit and Spectrum usage, etc; and 2) the use of new technologies for identifying development gaps: GIS solutions, Big Data, Data Visualization, Virtual Reality, and Enhanced Reality.

53. ITU Global Development Initiatives are supporting the implementation of SDGs, such as: the m-Powering Development for a Better Tomorrow that is an innovative and unique ITU initiative. The goal is to extend the benefits of mobile telephony to all strata of society, in order to build a truly inclusive information society, with special focus on remote rural and underserviced areas; The Smart Sustainable Development Model initiative aims at linking rural telecommunications development for general communications, business, education health and banking to disaster risk reduction and disaster management initiatives, to ensure an optimal use of technology and avoid duplication of efforts and investments.

54. To identify the global perspective of broadband connectivity that allows the ICT community to identify broadband placement, gaps and evidence-based investment opportunities, the ITU Interactive Transmission Map is continuously adding network links from all regions. The maps are a cutting-edge ICT-data mapping platform to take stock of national backbone connectivity (Optical fiber,



Microwave links and Satellite Earth Stations) as well as of other key metrics of the ICT sector, which currently covers Africa, Asia-Pacific, Arab, CIS, Europe and the Americas. At the time of this reporting, the Map presents information from 400 operator networks and 18,461 nodes worldwide. The research on the transmission links has reached 10,251,263 km of routes, of which 2,630,172 km have been imported to the Map.

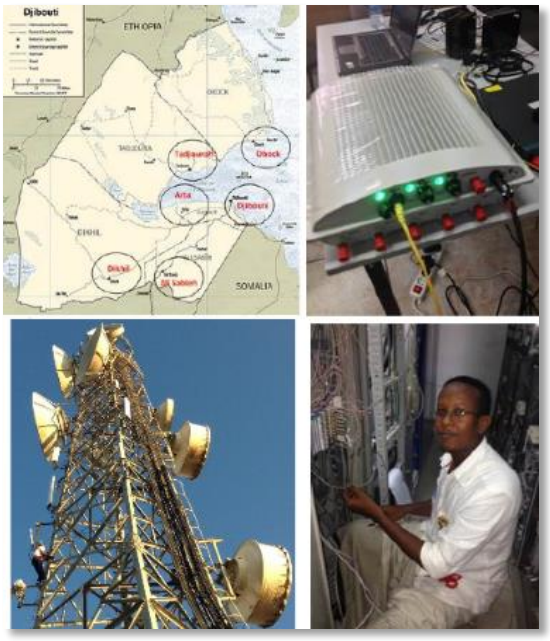
55. In order to enhance the Interactive Terrestrial Transmission Map in Europe, ITU coordinated the data collection and validation process covering infrastructure of more than 90% of European countries.

56. WTDC-AMS Regional Initiative 3 on Development of broadband access and adoption of broadband achieved to date the following results: provision of assistance for the development of guidelines for sustainable broadband infrastructure in rural areas; delivery of studies on broadband; capacity building activities; support for the establishment of Community ICT Centers; support to South American countries in terrestrial optical cable systems; and the formulation and development of national broadband policies to implement a broadband technology framework.

57. The pre-feasibility study to enhance ICT infrastructure for East African Community (EAC) to support the EAC-ITU- China Project was completed for the 3 components: Enhanced Broadband and connectivity infrastructure in East African Community, Regional E-transactions platform for e- government and e-commerce, and Centre of Excellence in ICT research and Innovation. A preliminary report was presented to stakeholders, including the Ministers of Rwanda and Uganda and the ITU SG during the Transform Africa Summit, held in Kigali, Rwanda on 10 May 2017.

58. Assistance to Member States on the Development of Broadband Access for CIS countries: Web-based software for selecting the most feasible solution for broadband deployment in CIS and Georgia based on information about specific location in CIS and Georgia (city, settlement, etc.).

59. As a follow-up to the Connect Africa Summit the ITU/Craig and Susan McCaw Broadband Wireless Network project for Africa is implementing broadband wireless networks and developing ICT applications to provide free or low cost digital access for schools and hospitals, and for underserved populations in rural and remote areas in selected countries. Activities taken from 2016-2017:

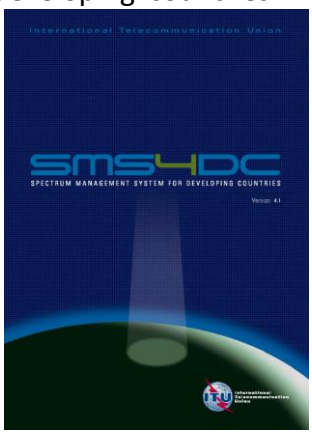


- *In Burkina Faso, a Broadband Network has been fully installed and is operational.* Tender Process for E-Learning.
- *In Djibouti, the project for broadband extension to 9 additional cities has concluded its procurement process for the required equipment and related resources.* Field Installations and last shipment have been completed.

- *Swaziland: N*ew Broadband Wireless Connectivity Model taking into consideration the Migration strategy to NGN in Swaziland and discussions on the way forward for Equipment procurement.
- *Broadband Network in Mali:* Administrative process and Needs Assessment.

60. A study and report of the Broadband strategy for Burundi have been completed and validated in Yaoundé at the end of January 2017 in the ITU Area Office premises in the presence of 6 delegates from the administration of Burundi.

61. ITU-D has made available a computer program known as SMS4DC (Spectrum Management System for Developing Countries) to assist administrations of developing countries in performing their spectrum management responsibilities more effectively. ITU has kept updating this program and more than 40 countries have subscribed to the tool .



62. ITU Arab regional training workshop on the SMS4DC was held in Djibouti, 14-18 June, 2015. First meeting of the SMS4DC users was held in 8-9 December 2016 with around 50 participants from 25 countries. Within the project supported by Korea, new modules and functionalities have been enhanced and published in August 2017 as version 5.1.

63. Enhanced Capacity of over 260 delegates from Arab countries in the fields of spectrum management and frequency planning and coordination through the organization of the 3rd Annual MENA Spectrum Management Conference, held on 24-25 January 2017 in Dubai, in partnership with Forum Global and TRA United Arab Emirates. This event was followed by the ITU workshop on Cross-Border Frequency Management in Arab States on 26 January 2017 in Dubai, UAE.

64. Assistance was provided to Timor-Leste on developing Spectrum Monitoring plan: Detailed report on developing Radio Frequency Monitoring capability delivered. National workshop on technical skill development of ANC (regulator) staff conducted. Skills of 12 technical engineers developed on RF monitoring.

65. Until the beginning of 2017 Spectrum Management Master Plans were provided within the framework of an ITU-Ministry of Science, ICT & Future Planning (MSIP) (Republic of Korea) project for countries in ASP (Brunei, Bangladesh, Pakistan, Thailand, Fiji, and Samoa) and in the Caribbean (Grenada and Saint Vincent and the Grenadines).

66. The "ITU Asia Pacific Centre of Excellence (CoE) online Training on Spectrum Management" was successfully held on 13-26 May 2017. 292 participants from diverse backgrounds, including Administrations, Regulators, Operators and academia (excluding presenters), registered for the course. The participants came from 49 countries, of which 20 were from Asia-Pacific region and 29 were from outside ASP region.

67. Assistance was provided to Nepal on updating National Radio Frequency Management Framework and draft Radio Law.

68. Regional Seminar for Europe and CIS on "Spectrum Management and Broadcasting was held with around 70 participants" in Rome on 29-31 May 2017. In 9 sessions, 45

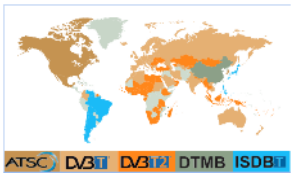
presentations were delivered on, among others, the Future of digital terrestrial television broadcasting, Digital dividend utilization, IMT 2020 (5G), Spectrum needs of IoT, etc.

69. 3rd Annual Asia-Pacific Spectrum Management Conference (2 - 3 May 2017) was conducted in partnership with Forum Global (over 200 participants), followed by ITU workshop on Managing spectrum in the age of wireless communication (3-4 May 2017) in Bangkok. The workshop was attended by 83 participants representing administrations, regulators, industry and operators.

70. Assistance on conformity and interoperability has been provided to developing countries. A C&I Assessment Study has been developed for South America region, and regional training events have been organized together with testing laboratory partners for AMS, ASP and AFR.

71. Enhanced knowledge in Conformance & Interoperability for Africa with a training held in Tunis in May 2017. 8 participants from 6 countries participated in the training in Regulatory framework and practical EMC tests. A Training for the Americas region focusing on Virtual Testing Laboratories has been organized in July 2017 (http://itu/int/go/CI_events).

72. More than 30 participants raised their awareness on Conformity and Interoperability (C&I) for 4G LTE through the ITU Asia-Pacific CoE online distance learning programme organized in partnership with CAICT.



73. A digital switch-over database was updated based on information from around 10 countries (see http://www.itu.int/en/ITU-D/Spectrum-Broadcasting/Pages/DSO/Default.aspx).

74. Within the framework of the ITU-Latin-American Development Bank (CAF) collaboration, a summary report on the digital broadcasting roadmaps, which includes 12 countries, has been prepared.

75. Country Assistances on development of framework for cross border RF interference management was provided to LAO P.D.R and Cambodia. Mongolia is being assisted on the development of Spectrum Management National Master-plan.

76. Enhanced the skills of 80 delegates from seven Arab countries in the area of Technical, Regulatory and Policy Aspects related to "Broadband Networks in the Era of App Economy". This was during the ITU Arab Forum on Future Networks, held in partnership with CIFODECOM on 21-22 February 2017 in Tunis, Tunisia. 80 delegates from seven Arab countries attended the Forum, where challenges and opportunities of the new App Economy were presented and discussed.

77. Relevant ITU activities (for all the three sectors) have been presented during the WHO International Advisory Committee Meeting on the Non-Ionizing Radiation Programme 29-(30 June 2017).

78. The "ITU Asia Pacific Centre of Excellence Training on Internet and IPv6 Infrastructure Security Program" (8-12 May 2017 at TOT Academy, Nonthaburi, Thailand) built capacity of 35 participants from across the Asia-Pacific in the area of IPv6 and Internet Infrastructure Security. The training workshop was organized by the ITU, the Ministry of Digital Economy and Society, Thailand and the APNIC with support from the IEEE Comsoc and the TOT Academy.

79. Assistance to Member states on Future Internet Exchange & IPv6-based broadband: Final Improvements for Future Internet Exchanges Publication and Publication on Future Internet Exchange.

80. Assisted Djibouti in the feasibility study for the establishment of a Regional Internet Exchange Point (IXP).

81. A workshop on IPv6 Deployment and IPv6 Security Workshop was held on 19-21 June 2017 at Thimphu, Bhutan, in partnership with Department of Information Technology and Telecommunication (DITT) and APNIC. The workshop was supported by ITU-DoCA (Australia) project. The workshop was attended by around 50 participants from government, regulators, industry and academia. Following the workshop, consultations on IPv6 roadmap development were also held with key stakeholders in Bhutan.

82. Furthermore, ITU develops a number of the large scale regional projects focusing on 28 regional initiatives facilitating development of the information and communication infrastructure. More information on these projects as well as the other projects can be found ITU-D Projects webpage.

83. In the Framework of ITU-D Study Group, the following questions related to AL-C2 have been approved by WTDC-14 with working mandate till 2017:

- *Question 1/1: Policy, regulatory and technical aspects of the migration from existing networks to broadband networks in developing countries, including next-generation networks, m-services, OTT services and the implementation of IPv6.*
- *Question 2/1: Broadband access technologies, including IMT, for developing countries*
- *Question 5/1: Telecommunications/ICTs for rural and remote areas*
- *Question 8/1: Examination of strategies and methods of migration from analogue to digital terrestrial broadcasting and implementation of new services*
- *Question 4/2: Assistance to developing countries for implementing conformance and interoperability programmes*
- *Resolution 9: Participation of countries, particularly developing countries, in spectrum management*
- *Question 7/2: Strategies and policies concerning human exposure to electromagnetic fields*

The Final Reports have been sent to WTDC-17 for final approval.

ITU-R SG1 Resolution 9 co-chair participation in WP1B work, modified the final report on efficient spectrum management and new broadcasting technologies;

As an input document to Question 1/1 and Question 2/1, ITU has contributed with a Report on Implementation of Evolving Telecommunication/ICT Infrastructure for Developing Countries: Technical, Economic and Policy Aspects. The report introduces essential telecommunication/ICT infrastructures and their technologies, economic and policy aspects supporting effective adoption of Next-generation Networks, and it is available online.

84. ITU is contributing to bridging the standardization gap between developing and developed countries. Instructed by PP-14 Resolution 123, WTSA-16 Resolution 44, and the new WTDC-14 Recommendation 22 on Bridging the Standardization Gap (BSG), regional workshops and other regional activities are receiving support from ITU Regional Offices to improve awareness, understanding and participation on the development of ICT standards developed by global and regional Standardization Development Organizations (SDOs).

85. In the implementation of Action Line C2, ITU continues to be at the forefront of providing global standards for telecommunication in areas such as broadband access and home networks and infrastructures for ultra-high-speed transport; as well as future networks including 5G and networking innovations in fields such as network slicing, fixed mobile convergence, information centric networking, software-defined networking, cloud computing, data management, and trusted network infrastructure. Since 1 December 2016, ITU-T approved 261 texts (as of 31 October 2017), including ITU-T Recommendations, Supplements and Technical Papers.

86. The third amendment of **Rec. ITU-T G.9701** doubles the aggregate net data rate achievable with G.fast, increasing its capacity to 2 Gbit/s using spectrum up to 212 MHz over traditional telephone lines, providing operators with a valuable complement to fibre to the home (FTTH) technologies in scenarios where G.fast proves the more cost-efficient strategy. **Recommendation ITU-T G.993.2 (2015) Amd.3 "Very high speed digital subscriber line transceivers 2 (VDSL2) - Annex D: Long Reach VDSL2"** (under approval) defines the Long Reach operation for VDSL2 without vectoring. **Recommendation ITU-T G.993.5 (2015) Amd.2 "Self- FEXT cancellation (vectoring) for use with VDSL2 transceivers - Annex A: Mitigating strong FEXT"** (under approval) defines a method for mitigating strong FEXT. **Recommendation ITU-T G.996.2 (2009) Amd.5 "Single-ended line testing for digital subscriber lines (DSL) - Amendment 5"** (under approval) contains the draft new amendment to G.996.2 on SELT in G.fast environment.

87. **Recommendation ITU-T G.9700 (2014) Amd.2 "Fast access to subscriber terminals (G.fast) - Power spectral density specification (2014) Amendment 2"** aligns the text of clause 6.5 on notching of specific frequency bands with ITU-T G.9701 (2014) and its latest amendments, completes the specification of 212 MHz profiles, adds Annex X "Adaptation to the coax medium" in support of Annex X " Operation without multi-line coordination intended for a crosstalk free environment" that has been specified in amendment 3 to ITU-T G.9701, and updates the table of International amateur radio frequencies in Appendix I. **Recommendation ITU-T G.9701 (2014) Amd.3 "Fast access to subscriber terminals (G.fast) - Physical layer specification: Amendment 3"** supports the following new functionality: full specification of the 212 MHz profile, Annex X – Operation without multi-line coordination intended for a crosstalk free environment (e.g., coax medium) including dynamic time assignment (DTA), Annex T – higher layer control aspects of DTA, and Annex S – software download to NTs.

88. **Recommendation ITU-T G.9701 (2014) Amd.4 "Fast Access to Subscriber Terminals (G.fast) – Physical layer specification"** (under approval) supports the following new functionality: Impulse noise monitoring (INM) and robust management channel recovery (RMCR).

89. **Revised Recommendation ITU-T G.9901 "Narrowband orthogonal frequency division multiplexing power line communication transceivers - Power spectral density specification"** specifies the transmitted output voltage in the band 9-535 kHz, the control parameters that determine spectral content, power spectral density (PSD) mask requirements, a set of tools to support the reduction of the transmit PSD, the means to measure this PSD for transmission over power line wiring, as well as the allowable total transmit power into a specified termination impedance. It also complements the system architecture, physical layer (PHY) and data link layer (DLL) specifications in Recommendations ITU T G.9902 (G.hnem), ITU-T G.9903 (G3-PLC), and ITU-T G.9904 (PRIME).

90. **Revised Recommendation ITU-T G.9903 "Narrowband orthogonal frequency division multiplexing power line communication transceivers for G3-PLC networks"** contains the physical layer (PHY) and data link layer (DLL) specification for the G3 PLC narrowband orthogonal frequency division multiplexing (OFDM) power line communication transceivers, for communications via alternating current and direct current electric power lines over frequencies below 500 kHz. The control parameters that determine spectral content, power spectral density (PSD) mask requirements, and the set of tools and procedures to support the measurement and reduction of the transmit PSD can be found in Recommendation ITU-T G.9901. This Recommendation adds several corrections of and improvements to the PHY, the DLL, and the routing parts of the specification. It also integrates Amendment 1 to Recommendation ITU-T G.9903 (2014), adding support for coexistence with other narrowband PLC technologies via the preamble-based coexistence mechanism specified in clause 10 of IEEE 1901.2.

91. Enhancements to optical fibre standards allow to extend and optimize the use of these optical fibres beyond their current capabilities. Approved **Recommendation ITU-T L.110 "Optical fibre cables for direct surface application"** defines the shape of low-cost, terabit-capable optical cable that can be deployed on the ground's surface with minimal expense and environmental impact. L.110 puts advanced optical technology in the hands of rural communities, leveraging the ingenuity of local communities to overcome the prohibitive costs of traditional fibre installation techniques. The design of the optical cable specified in L.110 builds on lightweight submarine-cable technology, technology with its first deployments targeted towards lakes and wetlands and other submarine environments less hostile than our oceans.

92. **Revised Recommendation ITU-T L.155 "Low-impact trenching technique for FTTx networks"** describes this trenching technique, which allows the easy installation, in narrow trenches, of underground optical cables and mini-cables in ducts or mini-ducts or directly buried. This type of narrow trench allows the use of reduced dimension machinery in small sized roads, typically those in cities, producing a lower quantity of waste material and so should be used in urban areas.

93. **Recommendation ITU-T L.162 "Microduct technology and its applications"** describes the solutions for indoor and/or outdoor installation of microducts in different conditions: directly into the trench, existing pipes, aerial applications, access to buildings.

94. **Recommendation ITU-T L.206 "Requirements for passive optical nodes: Outdoor optical cross-connect cabinets"** refers to outdoor optical cross-connect cabinets deployed as passive optical nodes in outdoor environments. It deals with the cabinet housing, internal fibre management system, cable attachment and termination system, and specifies the mechanical and environmental characteristics as well.

95. **Recommendation ITU-T L.404 "Field mountable single-mode optical fibre connectors"** describes the main features of field mountable single-mode optical fibre connectors, defines requirements for their optical, mechanical and environmental characteristics and lists the main test methods. Further, this Recommendation gives a general description of the basic principles of operation and of technologies of fabrication of field mountable single-mode optical fibre connectors.

96. **Recommendation ITU-T L.1700 "Requirements and framework for low-cost sustainable telecommunications infrastructure for rural communications in developing countries"** aims to bring broadband to rural communities. The standard builds on established technologies to identify the founding principles for low-cost, sustainable broadband backhaul infrastructure, with a special focus on rural communications in developing countries. As a framework standard, L.1700 is largely technology-neutral. The unique feature of L.1700 and its corresponding supplements is the focus on ease of deployment. Cost-effective, practical implementation is the standard's top priority. Reliability is the second most important attribute. This reverses the common approach to fibre-optic cable design – reliability is usually the first prize, but with L.1700, affordable implementation comes first. Local communities will have the ability to secure these on-surface lines, using everyday tools to partially bury the lines, settle them on ground underwater, suspend them aerially, or relocate the lines as necessary.

97. **L.Suppl.29 to ITU-T L.1700 on "Low-cost sustainable telecommunication for rural communications in developing countries using cellular radio technologies"** identifies a low-cost sustainable solution using cellular radio technologies consisting of base station system and backhaul for potential users of digital services in remote or rural areas.

98. **L.Suppl.30 to ITU-T L.1700 on "Setting up a low-cost sustainable telecommunication network for rural communications in developing countries using cellular network with capacity transfer".** This system "Cellular network with capacity transfer" has been developed taking into account specific requirements for communications in rural and remote areas with the special attention to a low-cost of all components of the system with low operating cost, low power consumption, very effective coverage zones and low requirements for maintenance of the system. The key benefit is achieved by relaying of the cellular air-interface in a frequency band other than standard cellular, which allows the substitution of significant part of the base station (BS) and microwave link (ML) or optical fiber links interconnecting them.

99. **L.Suppl.31 to ITU-T L.1700 on "Setting up a low-cost sustainable telecommunication network for rural communications in developing countries using satellite systems"** provides requirements for a low cost sustainable telecommunications infrastructure for rural communications in developing countries with focus on Very Small Aperture Antennas

for the users. It provides details on the generic requirements set out in L.1700 "Requirements and framework for low-cost sustainable telecommunications infrastructure for rural communications in developing countries".

100. Revisions to **Recs. ITU-T G.652 "Characteristics of a single-mode optical fibre cable"** and **G.657 "Characteristics of a bending-loss insensitive single-mode optical fibre and cable"** extend and optimize the use of these optical fibres beyond their current capabilities. Rec. ITU-T G.652 was released in 1984 as the first standard for single-mode fibres, leading to these fibres becoming known as "standard single-mode fibres". ITU-T G.652 fibres were the first to be deployed in public networks and still account for the vast majority of the fibres installed worldwide. Rec. ITU-T G.657 is a standard for single-mode fibres created in 2006 specifically for optical access networks, networks which are more demanding of fibre and fibre-optic cabling with respect to macrobending sensitivity and connectivity.

101. Revised **Rec. ITU-T G.654 "Characteristics of a cut-off shifted single-mode optical fibre and cable"**, which traditionally dealt with the characteristics of fibres for submarine cables, includes a new subcategory of fibre (G.654.E fibre) to support coherent digital transmission systems in terrestrial optical networks at rates beyond 100 Gbit/s.

102. **Recommendation ITU-T G.873.3 "OTN protection switching - Shared Mesh Protection"** defines the protocol and protection switching operation for shared mesh protection for the OTN at the ODU layer.

103. **Recommendation ITU-T G.9807.2 "10 Gigabit-capable symmetrical passive optical networks (XG(S) PON): Reach extension"** outlines the architecture and interface parameters for 10 Gigabit-capable symmetrical passive optical network (XG(S)-PON) systems with extended reach using a physical layer reach extension device, such as a regenerator or optical amplifier in the fibre link between the optical line termination (OLT) and optical network unit (ONU). Wavelength converting, continuous mode, 1:N and combination type reach extenders are also described. The maximum reach is up to 60 km with loss budgets of in excess of 28.5 dB being achievable in both spans.

104. **ITU-T G.Suppl.58 "Optical transport network (OTN) module framer interfaces (MFIs)"** describes several interoperable component-to-component multilane interfaces (across different vendors) to connect an optical module (with or without digital signal processor (DSP)) to a framer device in a vendor's equipment supporting 40G, 100G or beyond 100G optical transport network (OTN) interfaces. Only the structure of the 11G, 28G or 56G physical lanes of the different OTN module framer interface (MFI) examples is provided in this Supplement. For their electrical characteristics, the OIF-CEI IA specifications can be used. This Supplement relates to Recommendation ITU-T G.709/Y.1331.

105. The new G-series Supplement 59 provides guidance relevant to the long-term reliability of cabled optical fibres. The supplement describes the factors that impact the performance of an optical fibre over time, looking at fibres' optical and mechanical reliability and how this can be impacted by the cabling process.

106. **Recommendation ITU-T G.8132/Y.1383 "MPLS-TP Shared Ring Protection"** provides an architecture and mechanisms for shared ring protection for MPLS transport profile (MPLS-TP) networks. It describes the MPLS-TP Shared Ring Protection (MSRP) mechanisms and the Ring Protection Switch (RPS) protocol. The mechanisms defined herein protect

point-to-point MPLS-TP label switched paths (LSPs) against failures at the MPLS-TP section layer.

107. **Recommendation ITU-T G.8152/Y.1375 "Protocol-neutral management information model for the MPLS-TP network element"** contains the protocol neutral UML model for MPLS-TP NE Management, and provides a representation of the MPLS-TP technology using the methodologies that have been used for other transport technologies (e.g. SDH, OTN and Ethernet).

108. Synchronized mobile backhaul is essential to the success of wireless systems through 4G, 5G and beyond. A new industry standard **Rec. ITU-T G.8272.1/Y.1367.1 "Timing characteristics of enhanced primary reference time clocks"** enables highly accurate time synchronization and levels of reliability translating into holdover capabilities up to several days, with technology typically based on a combination of GNSS (Global Navigation Satellite Systems, such as GPS) and atomic clocks (e.g. cesium clocks).

109. **Recommendation ITU-T G.8271.2/Y.1366.2 "Network limits for time synchronization in packet networks with partial timing support from the network"** specifies the maximum network limits of phase and time error that shall not be exceeded. It specifies the minimum equipment tolerance to phase and time error that shall be provided at the boundary of these packet networks at phase and time synchronization interfaces. It also outlines the minimum requirements for the synchronization function of network elements. This Recommendation addresses the case of time and phase distribution across a network with packet-based method with partial timing support to the protocol level from the network.

110. **Recommendation ITU-T G.8273.3/Y.1368.3 "Timing characteristics of telecom transparent clocks"** defines the minimum requirements for transparent clocks. These requirements apply under the normal environmental conditions specified for the equipment. This Recommendation includes clock accuracy, noise generation, noise tolerance, noise transfer, and transient response for Telecom Transparent Clocks.

111. **Recommendation ITU-T G.811.1 "Timing characteristics of enhanced primary reference clocks"** outlines the requirements for enhanced primary reference clocks (ePRCs) suitable for frequency synchronization. These requirements apply under the normal environmental conditions specified for the equipment.

112. **Recommendation ITU-T G.8266/Y.1376 "Timing characteristics of telecom grandmaster clocks for frequency synchronization"** specifies the requirements for packet master clocks suitable for frequency synchronization in packet networks.

113. ITU-T SG9 approved **Recommendation ITU-T J.1106 "Requirement for Radio over IP transmission system"**, which describes functional requirements for radio over IP (RoIP) transmission systems. The purpose of RoIP system is to transmit data over cable service interface specifications (DOCSIS) based upstream (US) RF signal of cable modem (CM) to cable modem termination system (CMTS) through IP transmission in optic-based cable TV network. ITU-T J.1106 provides a cost-effective solution to adapt the HFC-based cable TV network devices into optic-based cable TV network devices.

114. **Recommendation ITU-T J.1105 "Requirement of channel switching service over Hybrid Fiber and Coaxial based network"** describes the requirement of channel switching service over Hybrid Fiber and Coaxial based network.

115. **Recommendation ITU-T J.223.2 "Cabinet DOCSIS (C-DOCSIS) System Specification"** defines the system architecture, the functional modules within the C-DOCSIS system, three different C-DOCSIS systems utilizing the functional modules, and the data and control interfaces between these modules for each of those systems. It also defines general device requirements for the different C-DOCSIS systems. With C-DOCSIS system, the modules that perform the physical layer and data link layer function can be deployed in the optical nodes of the HFC cable network.

116. ITU-T SG11 approved three Recommendations: **ITU-T Q.3053 "Signalling architecture and requirements for IP based short message service over ITU-T defined NGN"**, which specifies the signalling architecture for Internet Protocol (IP) based Short Message Service (SMS) over Next Generation Network (NGN), and identifies the signalling requirements for the interworking between NGN and mobile network supporting SMS.

117. **Recommendation ITU-T Q.3630 v.1 "Inter-IMS Network to Network Interface (NNI) — Protocol specification"** specifies requirements for the Inter-IMS Network to Network Interface (NNI). ITU-T Q.3630 v.1 endorses the ETSI TS 129 165 V10.21.0 (2016-01) Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; Inter-IMS Network to Network Interface (NNI) (3GPP TS 29.165 version 10.21.0 Release 10).

118. **Recommendation ITU-T Q.3713 "Signalling requirements for broadband network gateway pool"** which describes the scenarios, architecture and signalling for BNG pool in order to achieve the following outstanding benefits: high reliability for broadband access services, resource sharing and load balancing among multiple BNG devices which composed a pool, simplified OAM and reduction of OPEX&CAPEX.

119. The concluded **ITU-T Focus Group on network aspects of IMT-2020 ('5G')** delivered five draft ITU international standards and four draft ITU technical reports to drive related work in ITU-T Study Groups. They formed basis for publication of the flipbook on 5G. About 13 new work items, largely based on the outcomes of the Focus Group, were initiated in February 2017 covering requirements for IMT-2020 networks and fixed-mobile convergence, IMT-2020 architecture framework, IMT-2020 network management framework, network slicing. First standards on 5G out of these deliverables are Recommendations ITU-T Y.3100, Y.3110, Y.3111 (see below for more details) as well as Y.3100-series Supplement 44 "Standardization and open source activities related to network softwarization of IMT-2020" expected in summer 2017. A new ITU-T Joint Coordination Activity on IMT2020 (ITU-T JCA-IMT2020) is coordinating the ITU-T IMT2020 standardization work with the focus on the non-radio aspects within ITU-T, and is maintaining the roadmap of mobile communication studies and activities across three ITU Sectors.

120. ITU members have approved a new ITU-T standard **Y.3071 on information-centric networking**, a promising approach to achieving ultra-low-latency communications in the IMT-2020 (5G) environment. The standard is the first to emerge from ITU's study of the

wireline technology enablers of future 5G systems. ITU-T Y.3071 was developed by ITU's standardization expert group for 'future networks', ITU-T Study Group 13. ITU-T Y.3071 specifies the requirements and capabilities of data aware networking (DAN) to realize the use cases and scenarios described in ITU-T Supplement 35 to Recommendation Y.3033, Data aware networking – Scenarios and use cases, which are expected to be major applications/services provided on DAN. One of the objectives reflecting emerging requirements for future networks (FNs) is data awareness as specified in ITU-T Recommendation Y.3001 – Future networks: Objectives and design goals. DAN is expected to have capabilities optimized to handle enormous amount of data and to enable users to access desired data safely, easily, quickly, and accurately, regardless of their location by making information the destination of request delivery. DAN can be rephrased as the networking whose central concern is retrieving information, i.e., information centric networking (ICN).

121. **Recommendation ITU-T F.746.4 "Requirements for deployment of information centric networks"** describes the scenarios and requirements for deployment of information centric networks (ICN). The deployment supports flexible methods for deploying various ICN instances on a single network service provider (NSP) network, deploying an ICN instance over multiple NSP networks, and interoperating between different ICN instances. The framework requires decoupling the data plane and the control plane, and it is required to have one or more switches and controllers supporting such deployment. The software and hardware resources in the switches and controllers are required to be virtualized and to be used to create ICN instances. There exist appropriate inter-ICN service providers interfaces to facilitate interoperations between two ICN instances.

122. ITU-T Y-series Supplement 35 provides more information about the service scenarios and use cases supported by ICN.

123. **Recommendation ITU-T Y.3100 "Terms and definitions for IMT-2020 network"** describes essential terms and their definitions for IMT-2020 network to provide a general common understanding for ITU-T IMT-2020 related standard documents. It can be used as a guideline for the further development of IMT-2020 related documents. The terms defined in this Recommendation will constitute a reference for other ITU-T IMT-2020 related standard documents.

124. **Recommendation ITU-T Y.3110 "IMT-2020 Network Management and Orchestration Requirements"** describes requirements for network management and orchestration of IMT-2020. It describes high-level and functional requirements. The functional requirements consist of two levels: a) lifecycle management for all slices and b) instance management pertinent to each slice.

125. **Recommendation ITU-T Y.3111 "IMT-2020 Network Management and Orchestration Framework"** provides network management and orchestration architecture and functional components for design, deployment, and operation to implement IMT-2020 network covering fixed and mobile networks.

126. Two Demo days in December 2016 and July 2017 were full of 5G different concepts, demonstrations and presentations. In addition, ITU-T SG15 and ITU-T SG11 each plan in

Fall 2017 a workshop in their area of responsibility, namely, on transport requirements and on control plane for 5G.

127. In the reporting period ITU-T SG13 approved four more ITU-T Recommendations on cloud computing (see paragraph 118 for more details). The cloud computing roadmap, maintained by ITU-T SG13, lists and points to cloud computing standardisation efforts deliverables across telco/IT industry.

128. ITU-T SG13 is progressing the work on distributed cloud, cloud service brokerage, data storage federation, containers and micro-services, requirements for physical machines, requirements for inter-cloud data management and inter-cloud trust management.

129. The Symposium on the Future Networked Car (FNC-2017) within the 87th Geneva International Motor Show, 9 March 2017, brought together the automotive and ICT industries to explore advances in the field of connected, automated vehicles and the associated implications for business, technology and regulation. The Symposium was convened by ITU and UNECE. Technical sessions highlighted the crucial roles of connectivity, information security and privacy, artificial intelligence and machine learning in transforming vehicles transportation. The symposium also discussed how standards bodies can best meet industry needs. The Symposium was followed on 10 March by a meeting of the Collaboration on ITS Communication Standards (CITS).

130. An ITU/IMDA Workshop on How Communications will Change Vehicles and Transport was held in Singapore on 6 July 2017. The workshop sessions discussed, inter alia, connectivity options for connected vehicles and automated driving; cybersecurity for automotive communications; how connected vehicles (and ICTs more generally) are transforming the insurance sector; and the role to be played by artificial intelligence and machine learning in future transport systems. The workshop was followed on 7 July 2017 by a meeting of the Collaboration on ITS Communication Standards (CITS).

131. The concluded **ITU Focus Group Digital Financial Services (FG DFS)** has delivered 28 thematic reports in the areas of DFS ecosystem, interoperability, consumer protection and technology, innovation and competition. The reports support some 85 policy recommendations establishing guiding principles to assist the pursuit of digital financial inclusion at the national and global level.

132. On 13 December 2016 ITU hosted a seminar in London where the overall findings and key next steps were discussed towards implementation. A Workshop on Digital Financial Services and Financial Inclusion is planned to be held on 19 April 2017 to disseminate the main findings of the FG DFS to DFS stakeholders and to provide more information on the work to be undertaken as a follow up to the Focus Group activities.

133. ITU has partnered with the World Bank and the Bill & Melinda Gates Foundation in establishing a new multi-partisan **Financial Inclusion Global Initiative (FIGI 3x3x3)** aimed at accelerating progress towards universal access to financial services with the purpose to implement the recommendations of the Focus Group Digital Financial Services, the Payment Aspects of Financial Inclusion report of the World Bank and CPMI and the Level One Project of the Gates Foundation. FIGI aims to advance research in digital finance and accelerate digital financial inclusion in developing countries. The three-year programme

focuses on three different "model" developing countries – China, Egypt and Mexico – and consists of two complementary operational and knowledge work streams. The operational work stream supports each country's national authority – countries in which digital financial inclusion can significantly improve access to financial services for a large number of people without access to financial services. The knowledge work stream is designed to advance research and develop policy recommendations in three key areas of digital finance: security of information and communication technology (ICT) infrastructure and trust in digital financial services; digital IDs for financial services; and acceptance and use of e-payments by micro and small-scale merchants and their customers. Moreover, in the knowledge workstream, an annual FIGI Symposium will be organised by ITU to showcase the country implementations, the findings of the research on the three key areas mentioned above and provide a platform for knowledge sharing and transfer among telecom and financial services regulators, mobile network operators, DFS platform providers and the Fintech community. The first FIGI Symposium is planned on 29 November – 1 December 2017 in Bangalore, India.

134. ITU has created a new Focus Group to investigate the emerging questions of how best to standardize and regulate the interoperability and security aspects of digital fiat currency. Titled the '**ITU-T Focus Group on Digital Currency including Digital Fiat Currency'**, the group is open to participation by any interested party and will begin work in the final quarter of 2017. This new Focus Group aims to describe the environment necessary to achieve the dual objective of encouraging digital transactions while ensuring that Central Banks retain control over the issuance of currency and associated protections of the stability and integrity of the financial system. The Focus Group aims to build a bridge between ITU's technical expertise and the requirements of financial-services stakeholders interested in implementing secure digital fiat currency.

135. ITU, through TSAG, has created a new Focus Group to explore a number of topics of **Distributed Ledger Technology (DLT)**, for example, use-cases and applications, requirements for the implementation, regulatory and policy aspects, security and privacy aspects, among many other aspects.

The ITU-T FG DLT will analyse applications and services based on DLT that can be standardized by ITU-T study groups, identify best practices and guidance which could support the implementation of such applications and services on a global scale and identify a way forward that ITU-T SGs need to study in order to meet the urgent market needs.

The Focus Group will develop a security standardization roadmap for interoperable services based on DLT taking into consideration the activities currently undertaken by the various relevant groups, standards developing organizations (SDOs) and forums and a regulatory toolkit which may be used by national policymakers and regulatory authorities from ITU Member States. The Focus Group will also describe the ecosystem for applications and services based on DLT.

The establishment of the Focus Groups DFC and DLT was agreed by TSAG. TSAG will act as the Focus Group's parent group, responsible for defining ITU's response to the Focus Group's findings.

ITU-T SG13 started in summer 2017 a new work on scenarios and capability requirements of blockchain in next generation network evolution.

136. Internet of Things (IoT) standardization progressed and numerous ITU-T Recommendations were published by ITU-T Study Group 20:

136.1 Recommendation ITU-T Y.4101/Y.2067 "Common requirements and capabilities of a gateway for Internet of Things applications" provides the common requirements and capabilities of a gateway for Internet of things (IoT) applications. The provided common requirements and capabilities are intended to be generally applicable in gateway application scenarios.

136.2 Recommendation ITU-T Y.4114 "Specific requirements and capabilities of the IoT for Big Data". ITU-T Y.4114 specifies requirements and capabilities of the IoT for Big Data. It complements the developments on common requirements of the IoT [ITU-T Y.2066] and functional framework of the IoT [ITU-T Y.2068] in terms of the specific requirements and capabilities that the IoT is expected to support, in order to address the challenges related to Big Data. It also constitutes a basis for further standardization work (e.g. functional entities, APIs and protocols) concerning Big Data in the IoT.

136.3 Recommendation ITU-T Y.4115 "Reference architecture for IoT device capabilities exposure" clarifies the concept of the IoT device capability exposure (DCE), identifies its general characteristics and common requirements and provides relevant reference architecture and common procedures.

136.4 Recommendation ITU-T Y.4116 "Requirements of transportation safety service including use cases and service scenarios" describes requirements for providing transportation safety services. The use cases and related service scenarios which are used to extract requirements for various IoT services and applications are also described in this Recommendation.

136.5 Recommendation ITU-T Y.4117 "Requirements and capabilities of Internet of Things for support of wearable devices and related services" describes characteristics, specific requirements and capabilities of the IoT for support of wearable devices and related services.

136.6 Recommendation ITU-T Y.4455 "Reference architecture for IoT network service capability exposure" (under approval) introduces IoT network capability exposure (IoT NCE). The IoT NCE is a functional entity in network domain, and facilitates the Internet of things (IoT) applications and services to make full use of capabilities of their underlying networks. The IoT NCE can optimize user experience, improve network efficiency and expose network capability in order to optimize IoT applications and services. This Recommendation clarifies the concept of the IoT NCE, identifies its general characteristics and common requirements, and provides the reference architecture and relevant capabilities for the IoT NCE. Additionally, it provides several use cases and common procedures to illustrate the concept and the architecture of the IoT NCE.

136.7 Recommendation ITU-T Y.4500.1 "oneM2M- Functional Architecture" (under approval) harmonizes and specifies the end-to-end oneM2M functional architecture in the M2M Service Layer.

136.8 Recommendation ITU-T Y.4805 "Identifier service requirements for the interoperability of Smart City applications" specifies a set of requirements for identifier

services in smart city. The set of requirements may serve as the guidelines for developing new identifier services for smart city. It will include security features for service integrity, data confidentiality. The Recommendation will define a full list of security requirements for the identifier service.

137. On smart sustainable cities, ITU members approved two **Recommendations ITU-T L.1603 "Key performance indicators for smart sustainable cities to assess the achievement of sustainable development goals"** and **ITU-T L.1350 "Energy efficiency metrics of base station site", Recommendations ITU-T Y.4200 "Requirements for interoperability of smart city platforms"** and **Y.4201 "High-level requirements and reference framework of smart city platform"** (are under approval).

138. In March 2017, ITU-T SG20 created a new **ITU-T Focus Group on "Data Processing and Management (DPM) to support IoT and Smart Cities & Communities" (FG DPM)** which had its first meeting from 17 to 19 July 2017 in Geneva, Switzerland. The work of the FG-DPM will be carried out through five Working Groups: WG1 - Use Cases, Requirements and Applications/Services; WG2 - DPM Framework, Architectures and Core Components; WG3 - Data sharing, Interoperability and Blockchain; WG4 - Security, Privacy and Trust including Governance and WG5 - Data Economy, commercialization, and monetisation. A number of Internet-related topics are being addressed by this FG such as DPM in the context of IoT, web based microdata and metadata formats for IoT, blockchain usage in IoT for data management, security, privacy, and trust including data governance in DPM.

139. ITU-T SG13 is progressing the work on big data exchange framework and requirements, requirements for data provenance, big data metadata framework and conceptual model, requirements for data integration, data storage federation, data preservation, functional architecture of big data and BDaaS and some aspects of big data-driven networking like requirement of big data-driven networking mobile network traffic management and planning and application of DPI technology.

140. The **7th IoT Week**, organized on 6-9 June 2017, in Geneva, Switzerland, comprised over 200 sessions and activities, which provided an overview of the latest developments in the Internet of Things (IoT) domain: on emerging technologies, security and privacy, sustainable development, industry and market evolution, by addressing IPV6-based IoT deployment, IoT platform convergence for Smart Cities, large industries views on IoT data & security, drones, privacy & ethics, Web of Things, IoT for active and assisted living, IoT enabling technologies, telco industry perspectives on future IoT, IoT pilot projects, energy efficient solutions based on IoT, IoT standards ecosystem, IoT for inclusiveness and reduce inequalities (SDGs 4,5, 8,10), IoT for sustainable cities and communities (SDG 11), multi-stakeholder co-creation for IoT contexts, IoT for industry, innovation & infrastructure (SDG 9), IoT & the Fourth industrial revolution and Industry 4.0 & smart factory & delivery, emerging IoT solutions in developing countries, and IoT Start-ups, and concluded with the "Internet of Things Declaration to Achieve the Sustainable Development Goals".

141. An ITU Regional Workshop for CIS countries on "Internet of Things (IoT) and future networks", organized in St. Petersburg, Russia, on 19-20 June 2017, shared experiences in the field of the Internet of Things development and considered international standardization of the Internet of Things (IoT), perspectives of implementing IoT technologies in telecom networks in the CIS region, future telecom networks development

in the region, and international standardization of the technologies of the future networks and its applications.

142. A new standard puts forth the requirements for service management in cloud-aware Telecommunication Management System. Standardization roadmaps for cloud computing and for big data were developed and will be maintained.

143. **Recommendation ITU-T Y.3514 "Cloud computing - Trusted inter-cloud computing framework and requirements"** specifies a framework of trusted inter-cloud computing and relevant use cases. It provides general requirements for trusted inter-cloud and specific ones related to governance, management, resiliency and security and confidentiality of trusted inter-cloud.

144. **Recommendation ITU-T Y.3515 "Cloud computing - Functional architecture of Network as a Service"** provides Network as a Service (NaaS) functional architecture by specifying functionalities and functional components as well as reference points for Operation Support System (OSS). This Recommendation also describes the mapping between functionalities and functional requirements of NaaS, relationship between NaaS functional architecture and Software-Defined Networking (SDN), and illustrated usage of SDN and Network Functions Virtualisation (NFV) in support of NaaS architecture.

145. **Recommendation ITU-T Y.3516 "Cloud computing - Functional architecture of inter-cloud computing"** specifies inter-cloud computing functional architecture, including functions and functional components, based on the inter-cloud computing framework specified in ITU-T Y.3511. The Recommendation builds upon the functional view of the cloud computing reference architecture ITU-T Y.3502 and makes extensions to functional components with inter-cloud functions. This Recommendation also describes the mapping between functions and functional requirements of inter-cloud computing and examples of inter-cloud related reference points.

146. Expanding and accelerating standardization work on software-defined networking (SDN) yielded two new standards which lay down the foundational requirements for and architecture of SDN. A new standard **ITU-T L.1360 "Energy control of SDN architecture"** defines the integration of a Green Abstraction Layer into the ITU-T Software-Defined Networking architecture while another standard defines the security requirements and security reference architecture for SDN. A new standard **Rec. ITU-T G.7701 "Common Control Aspects"** describes the commonalities in SDN and ASON network management-control, covering common SDN and ASON control approaches. ITU-T G.7711/Y.1702 gives operators the ability to deploy SDN selectively, migrating parts of the infrastructure to SDN without nullifying the value of investments in legacy OSS infrastructure.

147. New **Recommendations ITU-T Y.3301 "Functional requirements of software-defined networking"** and **ITU-T Y.3302 on a functional architecture of SDN** were approved in January 2017.

148. A new **Recommendation ITU-T Y.3323 on soft network architecture for mobile packet core network**, complement these studies that form the basis of 5G work in SG13. ITU-T Y.3323 bridges current legacy mobile networks toward future networks and is considered to form the basis of 5G work in SG13. This new standard defines the design principles and

requirements of soft network architecture for mobile (SAME), i.e., flexible traffic steering, virtualization of SAME network functions, SAME network slice, and separation of control function and forwarding function, and thereby enables operators to improve the flexibility of their networks, such as using network resources more efficiently and enhancing their network capabilities more quickly.

149. SG13 also approved a new 'Supplement' to Y-series ITU standards, a supplement which provides an overview of "standardization and open-source activities related to network softwarization of 5G".

150. Network softwarization and slicing took centre stage at a 5G workshop and demo day held in Geneva, 11 July 2017. The workshop brought together a diverse set of interests – standards bodies, industry associations, operators, manufacturers, and academic and research institutes – to discuss the networking innovations necessary to achieve the 5G vision. Network softwarization and slicing, underpinning deeply programmable networks able to be sliced into virtual networks with very specialized capabilities, will give networks the agility required to support the specific requirements of any particular 5G application. The ambitious performance targets of 5G systems and the wide variety of envisioned 5G applications will demand future networks to be agile all-around players able to perform a wide array of specialized functions.

Coordination work of the ITU-T Joint Coordination Activity on SDN (JCA-SDN) continues.

151. **Recommendation ITU-T Y.2041 "Policy Control Mechanism in Multi-connection"** which describes policy control mechanism in multi-connection. ITU-T Y.2041 also covers scenarios, requirements, solutions, information flows. The multi-connection architecture is designed in heterogeneous networks, it has the ability to provide MUEs and network the functionality to maintain more than one access network connection simultaneously. It controls policies, flows and quality of service, etc. Policy control is useful or even necessary for multi-connection. Policy control determines how to use multiple access network connections, there can be several policies in multi-connection, such as QoS policy, service transfer policy, etc. ITU-T Y.2041 provides a coordination mechanism to ensure that all policies can work together in a coherent manner for multi-connection.

152. **Recommendation ITU-T Y.2304 "Network intelligence capability enhancement - Requirements and capabilities to support mobile content delivery optimization"** identifies the technical requirements and the enhanced NICE capabilities to support mobile content delivery optimization. In order to support mobile content delivery optimization, the NICE capabilities need to be specifically enhanced as follows: the access and core transport capabilities are required to be enhanced to support cache in access and core network, the policy control and enforcement capabilities are required to be enhanced to support caching policy and content transcoding, the content and context detection and analysis capabilities are required to be enhanced to support network status collection and mobility information updates, and the open environment capabilities are required to be enhanced to support 3rd party mobile content delivery applications.

153. **Recommendation ITU-T Y.2341 "Next Generation Network evolution - Requirements and capabilities for supporting authorized account messaging service"** specifies requirements of profile management, identification, messaging related features, open API,

resource allocation and policy control, as well as capabilities support of service stratum, transport stratum and end user in Next Generation Network (NGN) evolution for supporting authorized account messaging service.

154. Approved **Recommendation ITU-T Y.2773 "Performance models and metrics for deep packet inspection"** specifies the performance models and metrics for deep packet inspection in evolving networks.

155. The Fifth SG13 Regional Workshop for Africa on "ITU-T Standardization Work on Future Networks: Towards a Better Future for Africa", organized in Cairo, Egypt, on 2-3 April 2017, gave an overview of SG13 standardization work in areas of current high interest, such as IMT-2020 network aspects, Trust in ICT Infrastructures and Services, SDN, cloud computing and Big Data. It further shared the main issues in African Countries related to the workshop's topics, raised awareness about the priorities of SG13 standardization in the current study period and presented Africa's involvement in ITU-T Standardization as well as user experiences from African countries. A co-located regional group meeting used the outcomes of the workshop to review and revise the standardization priorities for the continent.

156. On emergency telecommunication , ITU-T SG2 approved **Recommendation ITU-T E.119 "Requirements for safety confirmation and broadcast message service for disaster relief"** which describes the requirements for safety confirmation and broadcast messaging for disaster relief, which can realize public organizations' business continuity plans (BCP) and can, to the best of their ability, help protect lives and property during a disaster. In the event of a disaster, it is very important that public organizations, such as telecommunication companies, electric power companies, hospitals, fire departments and local governments continue to operate and help save the lives of victims. Confirmation of the safety of officials or company staff is important, in order to continue operating their necessary tasks. In addition, to be effective, broadcast message systems should automatically confirm the status of officials or staff.

157. **ITU-T L.sup.35 to L-300series "Framework of disaster management for network resilience and recovery"** provides a framework of disaster management for improving network resilience and recovery (NRR) by reviewing high-level objectives of NRR against disasters, identifying several approaches (i.e., redundancy, congestion control, repair, substitute, and robustness) that meet the objectives, and clarifying the approaches with regard to the effective time frame (i.e., phase) for disaster recovery. Based on the identified approaches with effective disaster recovery phases, information about relevant technologies, including already available ones and emerging ones, is also provided.

158. New and revised ITU standards in the P.1100 series specify the electrical-accoustical characteristic, performance requirements, and test signals for hands-free communication in motor vehicles, and speech quality requirements for emergency calls originating from vehicles. A new ITU-T standard F.749.2 describes the service requirements and functional requirements for the vehicle gateway platform in the intelligent transport system.

159. ITU multimedia standards offer a common platform for innovation and are essential in easing the burden on global networks increasingly geared towards the massive exchange of video traffic. The fourth edition of the H.265 High Efficiency Video Coding was

standardized which adds extensions profiles for screen content coding, scalable range extensions profiles, and additional high throughput profiles. Discussion on a new generation of video compression standard that will succeed H.265/HEVC has matured within the informal Joint Video Exploration Team (JVET) with MPEG; a next generation video codec is expected to be ready in 2020-2021. Revised **Recommendation ITU-T H.264 (V12) "Advanced video coding for generic audiovisual services"** includes specification of the Progressive High 10 profile; the specification of support for additional colour-related indicators including the hybrid log-gamma transfer characteristics indication, the alternative transfer characteristics SEI message, the ICTCP colour matrix transformation, chromaticity-derived constant luminance and non-constant luminance colour matrix coefficients, the colour remapping information SEI message; and miscellaneous minor corrections and clarifications. ITU-T H.264 was developed jointly with ISO/IEC JTC 1/SC 29/WG 11 (MPEG) and the modifications introduced by this revision correspond in a technically aligned manner to Amendment 4 of the 8th (2014) edition of ISO/IEC 14496-10 and Amendment 1 to the subsequent 9th (not-yet published) edition.

160. A joint experts groups has started an initiative towards the case for a future video coding standard beyond today's 'High Efficiency Video Coding' (HEVC, published as ITU-T H.265 | ISO/IEC 23008-2, with the purpose to doubling the video compression capability of HEVC.

161. **Recommendation ITU-T H.627.1 "Protocols for mobile visual surveillance"** describes the detailed specification of reference points, message flows control methods, and overall protocols of a mobile visual surveillance system based on the requirements described in Recommendation ITU-T F.743 and functional architecture described in Recommendation ITU-T H.626.1. ITU-T H.627.1 focuses on the protocols of a visual surveillance system with mobile units and the services related to mobile units, such as a mobile customer unit accessing real-time video stream from a visual surveillance system. This Recommendation defines reference points, message syntax and semantics, and relevant protocols.

162. Approved **Recommendation ITU-T F.743.4 "Functional requirements for virtual content delivery networks"** specifies the requirements for virtual content delivery network (VCDN), including requirements on service provision, physical resource management, virtual resource management, VCDN logically isolated network partition (LINP) management, service management, backbone network, and security consideration.

163. ITU standardization work on performance, quality of service (QoS) and quality of experience (**QoE**) spans the full spectrum of terminals, networks and services, ranging from speech over fixed circuit-switched networks to multimedia applications over mobile and packet-based networks.

ITU-T SG12 approved **Recommendation ITU-T Y.1545.1 "Framework for Monitoring the QoS of IP network services"**, which is a diagnostic reference for IP network quality of service monitoring, and primarily as a guide to assist regulators monitor the quality of service of Internet that is provided by service providers (although subscribers and network service providers may also derive benefit). It highlights the necessity of monitoring the QoS of network services offered by Internet service providers (ISPs), from the diagnostic and regulatory points of view. The Recommendation also addresses quality of service evaluation scenarios, sampling methodology and testing tools for regulators. Finally, ITU-T

Y.1545.1 gives a guidance to regulators about minimum QoS parameters for evaluating the quality of Internet services.

Recommendation ITU-T P.1203 (revised) "Parametric bitstream-based quality assessment of progressive download and adaptive audiovisual streaming services over reliable transport" provides the introductory document for a set of documents that describe model algorithms for monitoring the integral media session quality for TCP-type video streaming. The models comprise modules for short-term audio- and video-quality estimation. The per-one-second outputs of these short-term modules are integrated into estimates of audiovisual quality and, together with information about initial loading delay and media playout stalling events, further integrated into the final model output, the estimate of integral quality. The respective ITU-T work item has formerly been referred to as P.NATS (Parametric non-intrusive assessment of TCP-based multimedia streaming quality).

Recommendation ITU-T P.1203.1 "Parametric bitstream-based quality assessment of progressive download and adaptive audiovisual streaming services over reliable transport - video quality estimation module" specifies the short-term video representation quality estimation modules for ITU-T P.1203 (Pv module). The ITU-T P.1203 series of Recommendations specifies modules for a set of model algorithms for monitoring the integral media session quality for transport control protocol (TCP) type video streaming. The models comprise modules for short-term video-quality (described in this part of the Recommendation family) and audio-quality estimation. The per-one-second outputs of these short-term modules are integrated into estimates of audio-visual quality and together with information about initial loading delay and media playout stalling events, they are further integrated into the final model output, to provide an estimate of integral quality. The respective ITU-T work item has formerly been referred to as "Parametric non-intrusive assessment of TCP-based multimedia streaming quality", or "P.NATS". The ITU T P.1203.1 part of ITU-T P.1203 provides details for the modules for bitstream-based, short-term video quality estimation.

ITU-T P.1203.2 "Parametric bitstream-based quality assessment of progressive download and adaptive audiovisual streaming services over reliable transport - audio quality estimation module" specifies the short-term audio quality estimation module for Recommendation ITU T P.1203. The ITU-T P.1203 series of ITU-T Recommendations specifies modules for a set of model algorithms for monitoring the integral media session quality for transport control protocol (TCP) type video streaming. The models comprise modules for short-term video-quality and audio-quality estimation (the latter specified in this Recommendation). The per-one-second outputs of these short-term modules are integrated into estimates of audio-visual quality and together with information about initial loading delay and media playout stalling events, they are further integrated into the final model output, the estimate of integral quality. The respective ITU-T work item has formerly been referred to as "Parametric non-intrusive assessment of TCP-based multimedia streaming quality" or "P.NATS". The Recommendation ITU-T P.1203.2 part of Recommendation ITU-T P.1203 provides details for the module for bitstream-based, short-term audio quality estimation.

Recommendation ITU-T P.1203.3 "Parametric bitstream-based quality assessment of progressive download and adaptive audiovisual streaming services over reliable transport - quality integration module" specifies the quality integration module for Recommendation ITU T P.1203. The ITU-T P.1203 series of ITU-T Recommendations specify modules for monitoring the audio, video and audiovisual quality of video services such as adaptive bitrate video streaming. The respective ITU T work item has formerly been referred to as P.NATS (parametric non-intrusive assessment of TCP-based multimedia streaming quality). The ITU-T P.1203.3 part of Recommendation ITU-T P.1203 can be applied to the monitoring of performance and quality of experience (QoE) of video services such as adaptive bitrate video streaming. Besides stream-based input information, the P.1203.3 quality integration module takes the per-one-second video- and audio-quality scores calculated according to P.1203.1 and P.1203.2, respectively, as input.

Recommendation ITU-T P.1301 "Subjective quality evaluation of audio and audiovisual multiparty telemeetings" concerns subjective quality assessment of telemeeting systems that provide multiparty communication between distant locations, using audio-only, video-only, audiovisual, text-based or graphical means as communication modes. The term multiparty refers to more than two meeting participants who can be located at two or more locations. Evaluation of those systems can focus on audio-only, video-only or audiovisual quality aspects and non-interactive or conversational quality can be assessed. This recommendation gives an overview of relevant aspects that need to be considered for subjective quality evaluation of multiparty telemeetings and provides guidance to recommendations describing the details of applicable methods and procedures. Aspects in this recommendation are also applicable to two-party telemeetings.

ITU-T Supplement 61 to ITU-T G.1020 series of Recommendations "IP aware QoS management" documents a packet oriented (IP-centric) QoS management model. This model is applicable to a wireless Access Point (e.g. WiFi AP, eNode B, Node B), referred to as "IP aware Access Point". In the supplement a possible cross-layer design for this model in LTE/EPC networks is described. Some implementation challenges are highlighted, together with possible solutions implying only minor modifications in the eNode B. Performance of this proposal compared to various implementations of the 3GPP QoS model is evaluated using the ns-3 simulator in realistic scenarios.

An ITU Workshop on Performance, QoS and QoE for Multimedia Services, organized on 24-25 July 2017, in Johannesburg, South Africa, discussed KPIs and methods for measuring and evaluating the QoS/QoE in LTE and LTE-Advanced networks, QoS/QoE regulatory and policy aspects, network performance and QoS requirements for 5G networks, and ITU-T activities on QoS/QoE.

164. **Recommendation ITU-T Y.3051 "The basic principles of trusted environment in ICT infrastructure"** is devoted to the issue of creating a trusted environment in ICT infrastructure providing information and communication services. The Recommendation provides the definition, common requirements and the basic principles of creating trusted environment.

Recommendation ITU-T Y.3052 "Overview of trust provisioning for ICT infrastructures and services" provides an overview of trust provisioning in ICT infrastructures and services. It introduces necessity of trust to cope with potential risks due to lack of trust. The concept

of trust provisioning is explained on the trusted ICT infrastructures and services. From the general concept of trust, the key characteristics of trust are described. In addition, the trust relationship model and trust evaluation based on the conceptual model of trust provisioning are introduced. Finally, it describes trust provisioning processes in ICT infrastructures and services.There are currently three more work items under development in ITU-T SG13 covering areas such as trustworthy networking, trust-based media services and trust index for ICT infrastructures and services. These studies will contribute to the development of the more reliable techniques to cope with the risks of knowledge sharing moving towards a knowledge society. To complement this work from the infrastructure perspective, ITU-T SG13 approved **Recommendation ITU-T Y.3514 "Cloud computing - Trusted inter-cloud computing framework and requirements"** and is working on overview of inter-cloud trust management.

165. The **United for Smart Sustainable Cities (U4SSC)** is a UN initiative supported by 16 UN Agencies and Programmes namely: CBD, ECLAC, FAO, ITU, UNDP, UNECA, UNECE, UNESCO, UN Environment, UNEP-FI, UNFCCC, UN-Habitat, UNIDO, UN-Women, WMO and WTO. The U4SSC advocates for public policies aimed at ensuring a catalytic role for information and communication technologies (ICTs) in enabling the transition to smart sustainable cities.

The U4SSC has developed the following deliverables:

- Flipbook on "Connecting cities and communities with the SDGs"
- Flipbook on "Enhancing innovation and participation in smart sustainable cities"
- Flipbook on "Implementing SDG11 by connecting sustainability policies and urban planning practices through ICTs".

U4SSC is currently working on the following deliverables: Guidelines on tools and mechanisms to finance SSC projects; Guidelines on strategies for circular cities; City science application framework; Guiding principles for artificial intelligence in cities and Blockchain 4 cities.

Within the U4SSC, ITU and UNECE together with CBD, ECLAC, FAO, UNDP, UNECA, UNESCO, UN Environment, UNEP-FI, UNFCCC, UN-Habitat, UNIDO, UN-Women, WMO and WTO developed a set of international key performance indicators (KPIs) for Smart sustainable cities (SSC) to establish the criteria to evaluate ICT´s contributions in making cities smarter and more sustainable, and to provide cities with the means for self-assessments. Dubai, Singapore, Montevideo, Manizales, Valencia, Wuxi, Guangshang, Valencia, Pully, Kairouan and over 50 cities are now implementing these KPIs for SSC.

166. The **ITU/WMO/UNESCO-IOC Joint Task Force on SMART[3] Cable Systems** is leading an ambitious new project to equip submarine communications cables with climate and hazard-monitoring sensors to create a global observation network capable of providing earthquake and tsunami warnings as well as data on ocean climate change and circulation. These new ''SMART (green) cables' would collect data of great value to the scientific community, as well industries such as fisheries and energy. The JTF is developing a pilot project (a so-called 'wet demonstrator') with the active participation of cable suppliers,

[3] Science Monitoring and Reliable Telecommunications

owners and researchers from existing ocean observatories. Experts have deemed the project to be technically feasible with the JTF members now working to solve business, legal and economic challenges. In order to identify qualified candidates to provide materials and services needed to realize the Wet Demonstrator project, an RFI (request for information) was sent to various organizations at the end of 2016. Several positive responses were received and they are now under study. ITU standardization continues to tackle disaster relief, network resilience and recovery, recognizing that the 21st century is playing host to an increasing prevalence of extreme weather events.

167. ITU-T is carrying out various activities to encourage and facilitate the participation of academia in the work of the Sector, as well as to benefit from their technical and intellectual expertise.

The 9th Kaleidoscope edition will be kindly hosted by the Nanjing University of Posts and Telecommunications (NUPT), Nanjing, China, on 27 – 29 November 2017. Kaleidoscope 2017 "Challenges for a data-driven society" calls for original academic papers that offer innovative and bold approaches relevant to technology, business and policy aspects of data management and analysis, and encourage the development of applications and services building on data technologies to improve society.

168. A **Chief Technology Officer (CTO) group** meeting with eight high-level industry executives and the strategic management of ITU's standardization arm, ITU-T, met for the first North-American CTO consultation meeting in San Jose, CA, US, 30 March 2017, to highlight their business priorities and supporting standardization strategies. The meeting issued a communiqué outlining emerging trends in 5G innovation and associated demands on ITU-T standardization. Chief Technology Officers (CTOs) of leading ICT companies in North America have reaffirmed that fixed-mobile convergence will be fundamental to the success of 5G systems. CTOs have also highlighted the great promise of information-centric networking to assist dynamic, performance-oriented management of ICT service quality, in addition acknowledging that high-performance 5G signal processing will demand significant innovation in chip architectures. CTOs also agree that identification, and associated protections of security and privacy, will be essential to the success of 5G use cases of the Internet of Things.

169. The 9th Chief Technology Officer (CTO) group meeting took place 24 September 2017, Busan, Republic of Korea. The high-level ICT industry executives (CTOs) have highlighted the strategic importance of international standardization's support for the evolution of global telecommunications networks and the contribution of artificial intelligence (AI) to the reduction of operational expenditure and the improvement of the use and maintenance of networks. The meeting called for further studies in ITU to identify and better understand the standardization needs for intelligence in 5G systems and the telecommunications sector. These studies should start with a review of AI-related definitions and terminology; cover an analysis of existing and emerging standards and specifications in this domain; and further address the architecture, interfaces, functional entities, service scenarios and protocols required for intelligence retrieval and actuation. CTOs called for ITU-T standardization work to take these new requirements into consideration, addressing short-distance, large-bandwidth and low-cost data center interconnection, edge cloud inter-networking, and emerging fronthaul and midhaul technologies to support the deployment of 5G systems. Participants recommended to ITU-

T to engage with OTT and vertical sector organizations to identify, understand and respond to their networking requirements in a timely and accurate manner.

170. Resolution 177 on Conformance and Interoperability (Dubai, 2014) endorsed the objectives of both Resolution 76 (Rev. Hammamet, 2016) and Resolution 47 (Rev. Dubai, 2014) on conformity and interoperability of ICT equipment. The goal of Resolution 76 (Rev. Hammamet) on Conformance and Interoperability testing is to help in increasing probability of interoperability and to ensure all the countries to benefit of ICTs. WTDC-14 reviewed Resolution 47 on enhancement of knowledge and effective application of ITU Recommendations in developing countries, including Conformance and Interoperability (C&I) testing of systems manufactured on the basis of ITU Recommendations". C&I issues are in the Dubai Declaration and are part of Regional Initiatives for AFR and ARB. Also, ITU Council-17 (May 2017) reviewed the C&I action plan.

ITU-T SG11 established the Conformity Assessment Steering Committee (ITU-T CASC) aimed at elaborating the recognition procedure of Testing Laboratories (TLs) which have competence for testing against ITU-T Recommendations according to the Guideline "Testing Laboratories Recognition Procedure" approved by ITU-T SG11 in 2015.

Currently, ITU-T CASC is collaborating with existing conformity assessment systems and schemes such as IEC and ILAC, including participation in a new task "ITU requirements" which was set up by IECEE Certification Management Committee (CMC). In the meantime, ITU-T CASC established a list of ITU-T Recommendations which may become subject of joint certification schemes according to the inputs received from ITU-T study groups and ITU members.

In February 2017, SG11 approved a new guideline "ITU-T CASC procedure to appoint ITU-T technical experts".

- The C&I Portal is responsible to gather all information about the work done in Pillars 1 (conformance assessment) and 2 (interoperability); as Pillars 3 (capacity building) and 4 (assistance in the establishment of test centres and C&I programmes in developing countries).

- The following ITU guidelines have been published on C&I: *i)* Guidelines for the development, implementation and management of mutual recognition arrangements/agreements (MRAs) on conformity assessment; *ii)* a Feasibility Study for the establishment of a Conformance Testing Center; *iii)* Guidelines on Establishing Conformity and Interoperability Regimes – Basic and Complete Guidelines.; *iv)* Guidelines for Developing Countries on establishing conformity assessment test labs in different regions.

- ITU has organized C&I training events and workshops in the regions. During these events, key issues were discussed highlighting the relevance of accreditation and certification, including mutual recognition agreements and arrangements to increase confidence in conformity assessment and decreasing the need of repeated testing. Trainings on EMC, mobile terminals, and C&I regimes for experts from Americas, Africa, Arab, CIS, and Asia-Pacific regions

has been organized in the premises of partners' laboratories in the regions. Guidelines for building Test Labs for C&I of equipment and systems in developing countries were distributed, during the forums and the training courses.

- ITU is preparing assessment studies in the regions to determine C&I areas of commonalities and differences in the concerned countries, allowing to assessing the present situation in each beneficiary country and proposing a common C&I regimes for the participant countries. While promoting regional integration on ICT, the result of the studies can include either building new labs and/or establishing MRAs, as appropriate. Until 2016, assessment studies on C&I for SADC, Maghreb, EAC, COMTELCA the Caribbean Regions were finalized. Follow-up for each of the regions are taking place.

- The ITU is providing assistance to developing countries on conformity and interoperability tailored to their needs. The ITU assisted Sri-Lanka, Zambia, Tanzania, Paraguay, and Ghana in building national Human capacity for C&I and to Government of Mongolia in setting up Type Approval systems in the country.

  The "ICT product conformity database" provides industry with a means to publicize the conformance of ICT products and services with ITU-T's international standards. Currently, the C&I database contains more than 500 entries which include e-health devices, mobile phones, Ethernet services and IPTV. In cooperation with the Personal Connected Health Alliance (formerly Continua Health Alliance), a list of devices previously tested according to these new Recommendations were included in ITU's "ICT product conformity database" at its launch. Information was provided on 95 e-health products for inclusion in the database at its launch. The e-health devices populating the database were tested for compliance with the specifications of the ITU-T H.810 "Interoperability design guidelines for personal health systems" sub-series, which are a transposition of the Continua Design Guidelines as international standards. The testing procedures are specified in the ITU-T H.820-H.850 sub-series of Recommendations. ITU-T SG11 finalized the first set of Recommendations (58) which specify requirements and relevant test specifications for basic call and some supplementary services for SIP-IMS. More details are available on SIP-IMS web page.

  A series of **ITU test events on IPTV** has been organized to offer a continuous platform to test products based on both existing and developing ITU-T IPTV standards, to meet rapidly growing market needs and to improve the ITU-T standards and test specifications on IPTV. Based on these testing experiences, IPTV manufacturers showed interest in conducting conformance testing of their products to submit entries to populate the ITU Product Conformity Database, after successfully passing the relevant tests. To meet this market demands, ITU-T SG16 started a new pilot project of conformity assessment against Recommendation ITU-T H.700 series, as listed on the relevant webpage on the C&I portal and established an ITU IPTV testing team. The team and Keio University conducted conformance testing on ITU-T H.721 "IPTV terminal devices: Basic model" using HSTP-CONF H721 – Conformance testing specification for ITU-T H.721 on 17 January 2017, Geneva, and ITU-T H.702 "Accessibility profiles for IPTV systems" using HSTP-CONF-H702 - Conformance testing specification for H.702 on 12 May 2017 in Geneva. The required tests were successfully conducted.

Following the three ITU test events aimed at testing the performance of mobile phones' narrowband and/or wideband communications with vehicle-mounted hands-free terminals which was held in May 2014, May 2016 and November 2016, ITU organized a roundtable on 10 March 2017 (webpage). At the event, automakers and mobile phone vendors discussed possible approaches to address such issues and tried to find a way how to improve the voice quality achieved by mobile phones when connected as gateways to car hands-free terminals.

The fourth ITU test event on compatibility of mobile phones and vehicle hands-free terminals will take place at ITU Telecom World 2017, Busan, Korea (Rep. of).

171. ITU has developed an 'EMF Guide mobile app' providing an up-to-date reference of the EMF information provided by the World Health Organization and ITU. The 'EMF Guide mobile app' is available in 6 languages. In April 2016, the EMF Guide & Mobile App on EMF was translated into Malay. It was launched during the Symposium on ICT, Environment and Climate Change by Dato'Jailani Johari, Deputy Minister of Communication & Multimedia, Malaysia.

172. ITU and its partners, sharing a common community of interest, have recognized the relationship between IMT — International Mobile Telecommunication system — and "5G" and are working towards realizing the future vision of mobile broadband communications.

173. In the framework of ITU-R Sector and Intersectoral objective number R.1: 'Meet, in a rational, equitable, efficient, economical and timely way, the ITU membership's requirements for radio-frequency spectrum and satellite-orbit resources, while avoiding harmful interference', the following outcomes and outputs have been achieved:

Outcomes:
R.1-1: Increased number of countries having satellite networks and earth stations recorded in the Master International Frequency Register (MIFR)
R.1-2: Increased number of countries having terrestrial frequency assignments recorded in the MIFR
R.1-3: Increased percentage of assignments recorded in the MIFR with favourable finding
R.1-4: Increased percentage of countries which have completed the transition to digital terrestrial television broadcasting
R.1-5: Increased percentage of spectrum assigned to satellite networks which is free from harmful interference
R.1-6: Increased percentage of assignments to terrestrial services recorded in the MIFR which are free from harmful interference
Outputs:
R.1-1 Final acts of world radiocommunication conferences, updated Radio Regulations
R.1-2 Final acts of regional radiocommunication conferences, regional agreements
R.1-3 Rules of Procedure adopted by Radio Regulations Board (RRB)

R.1-4 Results of the processing of space notices and other related activities

R.1-5 Results of the processing of terrestrial notices and other related activities

R.1-6 RRB decisions other than the adoption of Rules of Procedure

R.1-7 Improvement of ITU-R software

Outputs:

R.1-1 Final acts of world radiocommunication conferences, updated Radio Regulations

Following the World Radiocommunication Conference 2015 (WRC-15), the updated version of the Radio Regulations (Edition of 2016) was published in December 2016 and made freely available to the public.

The Conference took a number of decisions, which are reflected in the updated Radio Regulations or recorded in the minutes of its plenary sessions. In particular, the Conference approved various resolutions relating to the preparation of WRC-19 and WRC-23. The preparatory studies requested by these resolutions are being conducted within ITU-R, with the support of the regional groups and other international organizations, and address the following topics:

- Earth stations on board unmanned aircraft[4]
- Earth stations in motion, Non-geostationary systems in the fixed-satellite service, High-altitude platform stations (HAPS)[5]
- International Mobile Telecommunications (IMT)[6]
- Wireless Access Systems including radio local area networks (R-LAN)[7]
- Intelligent Transport Systems (ITS)[8]
- Meteorological-satellite and Earth exploration-satellite services (space-to-Earth)[9]
- Machine-type communication infrastructures[10]

R.1-2 Final acts of regional radiocommunication conferences, regional agreements

No regional radiocommunication conferences were organized during the considered period.

R.1-3 Rules of Procedure adopted by Radio Regulations Board (RRB)

The RRB met three times in 2016 and adopted 32 new or revised Rules of Procedure (RoPs) relating to decisions by WRC-15 or practice by the Bureau on the application of the Radio

[4] WRC-15 Res. 155; WSIS AL C2; SDG Targets 2.3, 2.4, 2.a, 14.a

[5] WRC-15 Res. 158, 159, 160; WSIS AL C2; SDG Target 9.c

[6] WRC-15 Res. 238; WSIS AL C2, C3, C7; SDG Targets 1.4, 3.8, 4.2, 4.3, 4.7, 5.b, 8.1, 8.2, 9.1, 9.3, 9.c, 10.2, 11.2, 13.1, 13.3, 16.7, 16.10

[7] WRC-15 Res. 239; WSIS AL C2, C3, C7; SDG Targets 3.8, 4.2, 4.3, 4.7, 5.b, 8.1, 8.2, 9.c, 10.2, 16.7, 16.10

[8] WRC-15 Res. 237; WSIS AL C2, C3, C7; SDG Targets 3.6, 9.5, 9.c, 11.2

[9] WRC-15 Res. 766; WSIS AL C2, C3, C7; SDG Targets 1.5, 2.4, 3.9, 11.5, 11.b, 13.1, 13.3, 13.b, 14.1, 14.2

[10] WRC-15 Res. 958; WSIS AL C2, C3, C6, C7; SDG Targets 2.3, 2.4, 2.a, 3.6, 11.2, 11.5, 11.b, 13.1

Regulations and Regional Agreements. Furthermore, a list of proposed new or revised RoPs is being maintained for the period 2016 – 2019 (see Document RRB16-2/3(Rev.4)). [11]

R.1-4 Results of the processing of space notices and other related activities

The processing of space notices covered the following elements:[12]

- 1,336 Advance Publication Information
- 401 requests for coordination for non-planned services, for which the treatment time increased beyond the four-month regulatory time limit, up to a maximum of 8 months, due to the unusually large number of submissions received at the end of WRC-15 and six month later as a result of the new allocations to FSS decided by WRC-15 and of the necessary modifications in processing software to reflect these decisions.
- 166 recordings of satellite networks in the MIFR
- 505 recordings of earth stations in the MIFR
- 41 requests for inclusion and 34 recordings in Appendices 30/30A Regions 1 and 3 Lists, 30 notifications pursuant to Article 5 of Appendices 30/30A.
- 42 requests for inclusion and 7 recordings in the Appendices 30B List, 7 notifications pursuant to Article 8 of Appendix 30B.
- 106 Due Diligence Information
- Cost recovery (CHF 15.6 million)
- 283 suppressions of satellite network filings, for not meeting the regulatory deadlines or the due diligence obligations, with the consent of the RRB, where appropriate.
- 77 cases of assistance provided to administrations for space stations and 368 for earth stations.
- 26 reports of harmful interference.

R.1-5 Results of the processing of terrestrial notices and other related activities

The processing of terrestrial notices covered the following elements:[13]

- 215 258 terrestrial notices for recording in the Master International Frequency Register and frequency Plans;

[11] CS No. 95, WRC-15 decisions recorded in the minutes of the plenary sessions; WSIS AL C2; SDG Target 9.c

[12] Art. 12 of the CV; Council Dec. 482; Articles 9, 11, 13, 14, 15, 21 and 22, Appendices 4, 5, 7, 8, 30, 30A, 30B of the RR; Res. 4 (Rev.WRC-03), 49 (Rev.WRC-15), 55 (Rev.WRC-15), 85 (WRC-03), 148 (Rev.WRC-15), 539 (Rev.WRC-15), 552 (Rev.WRC-15), 553 (Rev.WRC-15); WSIS AL C2; SDG Target 9.c

[13] Art. 12 of the CV; Art. 9, 11, 12, 13, 14, 15, 16, 19, 20, 21, 23, 24, 27, 28, 43, 50, 51, 52, 56, 58, Appendices 4, 5, 17, 25, 26, 27 of the RR; Res. 1 (Rev.WRC-97), 12 (Rev.WRC-15), 13 (Rev.WRC-97), 122 (Rev. WRC-07), 205 (Rev.WRC-15), 207(Rev.WRC-15), 331 (Rev.WRC-12), 339 (Rev.WRC-07), 356 (Rev.WRC-07), 417 (Rev. WRC-15), 424 (WRC-15), 535 (Rev.WRC-15), 612(Rev.WRC-12), 647(Rev.WRC-15), 749 (Rev.WRC-15), 760 (WRC-15), 906 (Rev.WRC-15); Regional Agreements ST61, GE75, RJ81, GE84, GE85-M, GE85-N and GE06; WSIS ALC2; SDG Target 9.c10 Report on the implementation of the strategic plan and activities of the Union

- 2 994 notifications containing 596 543 coast and ship stations for recording in the ITU maritime database;
- 12 341 high frequency broadcasting requirements.
- Maintenance of the reference databases on emergency communications, oceanographic radars, means of station identification, geographical and administrative data.
- 154 monitoring observations in the context of the monitoring program in the frequency band 406-406.1 MHz;
- 48 832 monitoring observations in the context of the monitoring program in the frequency bands between 2 850 kHz and 28 000 kHz.
- 4 434 reports of harmful interference.

R.1-6 RRB decisions other than the adoption of Rules of Procedure

The RRB examined a number of requests relating to various terrestrial and satellite networks, and cases of harmful interference. This activity covered the following elements:[14]

- Suppression from the Master Register of frequency assignments of one satellite network pursuant to No. 13.6 of the RR, and maintenance of the frequency assignments of two other satellite networks.
- Extension of the regulatory deadline for bringing into use (BIU) of the frequency assignments of seven satellite networks, two of which were cases of co-passenger delay and four cases of force majeure. Rejection of one request to extend the deadline for one other satellite network. Rejection of a request to extend the regulatory deadline for electric propulsion satellites.
- Rejection of a request to reinstate a satellite network in the absence of replies to coordination requests.
- Reinstating of a satellite network following reference to CS Article 48 by the notifying administration.
- Re-instating of two satellite networks with unchanged date of receipt. Rejection of a request to change the date of receipt of a satellite filing.
- Rejection of a request to transfer the function of Notifying Administration for four satellite networks to another administration.
- Regular review by the RRB of the situation of harmful interference. With respect to the interference caused by Italian TV stations in the UHF band, a 3-year legal, financial and regulatory effort by the Italian administration resulted in the successful switch-off of Italian TV transmissions on 61 frequencies that had been causing harmful interference to the services of other countries.

[14] CS No. 96 and 96; Art. 9, 11, 13, 14, 15, Appendices 4, 5, 7, 8, 30, 30A, 30B of the RR; Res. 4 (Rev.WRC-03), 49 (Rev.WRC-15), 80 (Rev.WRC-07); Regional Agreements GE84 and GE06; WSIS AL C2; SDG Targets 3.d, 4.7, 5.b, 9.c, 10.2, 11.4, 13.1, 16.7, 16.10

R.1-7 Improvement of ITU-R software

The BR develops, updates and maintains a significant number of software applications and databases to assist in the implementation of the Radio Regulations and Rules of Procedure, and in particular to enable timely processing, examination and publication of the relevant terrestrial frequency notifications and satellite network filings. In order to take into account the evolution of the Radio Regulations and associated Rules of Procedure, the evolution of technology and security factors, these software applications and databases need continuing development and maintenance. In 2016, the ITU-R software and data bases benefited from the following elements:[15]

- Migration of the Global Administration Data System (GLAD) database from Ingres to SQL server, development of a new interface for updating GLAD information and creation of a new layout for the publication of GLAD information on the web.
- Development of a web application providing online access to the MIFR for all terrestrial services.
- Delivery of new and/or improved versions of space services processing software for external use (BR IFIC (Space)).
- Delivery of a new space services database scheme design, in response to WRC-15 and RRB decisions. The software and the new database were presented to the membership at WRS-16 and through circular letters CR/389, CR/393, CR/394, CR/403, and CR/411.
- Integration of two third-party software packages into the space services technical examinations software suite (GIBC), to allow for equivalent power-flux density (EPFD) validation calculations. This was presented to membership at WRS-16 and through circular letters CR/405 and CR/414.
- Maintenance of the SpaceWISC system for online submission and publication of advance publication information for space services networks subject to coordination. In parallel, a new system has been developed to implement the extension of the scope of Resolution 908 (WRC-12) from API to coordination and notification, as decided by WRC-15. The first deliverable is the as-received publication web site mentioned in circular letters CR/401 and CR/415.
- Steps toward the implementation of a database and corresponding web application for submission and publication of harmful interference reports for space services (SIRRS). The look and feel of the system was presented to membership at WRS-16 and the system will be available for external testing by the end of first quarter 2017.
- Delivery of new and updated versions of the reference databases (including new data and schemes) needed for the technical and regulatory examinations by the BR of terrestrial frequency assignments in the bands shared between terrestrial and space services, taking into account WRC-15 and RRB decisions.

[15] PP Res. 186, Art. 12 of the CV, Art. 9, 11, 13, 14, 15, Appendices 4, 5, 7, 8, 30, 30A, 30B of the RR, Res. 85 (WRC-03), 163 (WRC-15), 164 (WRC-15), 908 (Rev. WRC-15); RRB RoP; RAG Advice to the Director; WP4A (Doc. 4A/669 Annex 14); WSIS AL C2; SDG Targets 1.4, 9.c, 17.7, 17.8, 17.9, 17.1611 Report on the implementation of the strategic plan and activities of the Union

- At the request of WP4A (Doc. 4A/669 Annex 14), implementation of changes in the way affected networks are indicated in the space systems technical examination software and database and made available a new website with information on affected networks (Notex). This new functionality was described in CR/397.
- Delivery of new and updated versions of all terrestrial services processing software, both for internal (TerRaSys) and external (BR IFIC (Terrestrial)) use, including improved database schemas and updated validation and examination software modules for the submission of terrestrial frequency notifications, as a consequence of WRC-15 and RRB decisions. The software enhancements and new requirements were presented to membership at WRS-16 and through the relevant circular letters.
- Development of an updated version of the Radio Regulations Navigation Tool, in order to incorporate the new version of the Radio Regulations and other relevant texts. The software was presented to membership at WRS-16.
- Delivery of a new software tool for the electronic display and analysis of RR5 Table of Frequency Allocations and associated footnotes. The software was presented to membership at WRS-16 and entered a joint beta test phase with the membership.
- Continuation of the work for improving the security of software applications and databases, as per the recommendations of the Radiocommunications Advisory Group (RAG) on the BR information System, including disaster recovery and business continuity procedures, isolation and protection from outside exposure.

174. In the framework of ITU-R Sector and Intersectoral objective number R.2 to: 'Provide for worldwide connectivity and interoperability, improved performance, quality, affordability and timeliness of service and overall system economy in radiocommunications, including through the development of international standards', the following outcomes and outputs have been achieved:

Outcomes:

R.2-1: Increased mobile-broadband access, including in frequency bands identified for international mobile telecommunications (IMT)

R.2-2: Reduced mobile-broadband price basket, as a percentage of gross national income (GNI) per capita

R.2-3: Increased number of fixed links and increased amount of traffic handled by the fixed service (Tbit/s)

R.2-4: Number of households with digital terrestrial television reception

R.2-5: Number of satellite transponders (equivalent 36 MHz) in operation and corresponding capacity (Tbit/s); Number of VSAT terminals; Number of households with satellite television reception

R.2-6: Increased number of devices with radionavigation-satellite reception

R.2-7: Number of Earth exploration satellites in operation, corresponding quantity and resolution of transmitted images and data volume downloaded (Tbytes)

Outputs:

R.2-1 Decisions of Radiocommunication Assembly, ITU-R resolutions

R.2-2 ITU-R recommendations, reports (including the CPM report) and handbooks

R.2-3 Advice from the Radiocommunication Advisory Group

Outputs:

R.2-1 Decisions of Radiocommunication Assembly, ITU-R resolutions

In 2015, the Radiocommunication Assembly (RA) approved 36 new or revised ITU-R Resolutions inviting ITU-R to conduct studies on radiocommunication matters, including:

- Disaster prediction, detection, mitigation and relief[16]
- Reduction of energy consumption for environmental protection and mitigating climate change by use of ICT/radiocommunication technologies and systems[17]
- Future development of IMT for 2020 and beyond[18]
- Telecommunication/ICT accessibility for persons with disabilities and persons with specific needs[19]
- Improving the dissemination of knowledge concerning the applicable regulatory procedures for small satellites, including nanosatellites and picosatellites[20]
- Development and deployment of international public telecommunications via satellite in developing countries[21]

R.2-2 ITU-R recommendations, reports (including the CPM report) and handbooks

The ITU-R Study Groups developed 23 new or revised recommendations, 27 new or revised reports, and one new Handbook, including:

ITU-R Recommendations, Reports and Handbooks on terrestrial and satellite broadcasting services[22]

Recommendations:

- BO.1784-1: Digital satellite broadcasting system with flexible configuration (television, sound and data)

[16] PP Res. 136; Res. ITU-R 55; WSIS AL C2, C7; SDG Targets 1.5, 2.4, 9.C, 11.5, 11.b, 13.1

[17] Res. ITU-R 60-1; WSIS AL C2, C3, C7; SDG Targets 1.5, 2.4, 3.9, 7.3, 11.5, 11.b, 13.1, 13.3, 13.b, 14.1, 14.2

[18] PP Res.137, 139, 197, 200, and 203; Res. ITU-R 65; WSIS AL C2, C3, C7; SDG Targets 1.4, 3.8, 4.2, 4.3, 4.7, 5.b, 8.1, 8.2, 9.1, 9.3, 9.c, 10.2, 11.2, 13.1, 13.3, 16.7, 16.10

[19] PP Res. 80 and 175; Res. ITU-R 67; WSIS AL C2, C4; SDG Targets 10.2, 11.2, 11.5, 11.B, 4.5, 4.A, 8.5

[20] PP Res. 80; Res. ITU-R 68; WSIS AL C6; SDG Target 17.6

[21] PP Res. 30, 34, 80, 135, 137, 139, 178, and 203; Res. ITU-R 69; WSIS AL C2; SDG Targets 9.C, 17.614
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[22] Res. ITU-R 5-7; WSIS AL C2; SDG Targets 3.d, 4.7, 5.b, 9.c, 10.2, 11.4, 13.1, 16.7, 16.10

- BO.2098-0: Transmission system for UHDTV satellite broadcasting
- BS.2094-0: Common definitions for the Audio Definition Model
- BT.1206-3: Spectrum limit masks for digital terrestrial television broadcasting
- BT.2036-1: Characteristics of a reference receiving system for frequency planning of digital terrestrial television systems
- BT.2095-0: Subjective assessment of video quality using Expert Viewing Protocol
- BT.2100-0: Image parameter values for high dynamic range television for use in production and international programme exchange

Reports:

- BO.2019-1: Interference calculation methods
- BO.2397-0: Satellite transmission for UHDTV satellite broadcasting
- BS.2213-3: Impact of audio signal processing and compression techniques on terrestrial FM sound broadcasting emissions at VHF
- BS.2214-2: Planning parameters for terrestrial digital sound broadcasting systems in VHF bands
- BS.2217-2: Compliance material for Recommendation ITU-R BS.1770
- BS.2388-1: Usage guidelines for the audio definition model and multichannel audio files
- BT.2049-7: Broadcasting of multimedia and data applications for mobile reception
- BT.2215-6: Measurements of Protection Ratios and Overload Thresholds for Broadcast TV Receivers
- BT.2245-2: HDTV and UHDTV test materials for assessment of picture quality
- BT.2252-2: Objective quality coverage assessment of digital terrestrial television broadcasting signals of Systems A and B
- BT.2267-6: Integrated broadcast-broadband systems
- BT.2301-2: National field reports on the introduction of IMT in the bands with co-primary allocation to the broadcasting and the mobile services
- BT.2343-2: Collection of field trials of UHDTV over DTT networks
- BT.2344-1: Information on technical parameters, operational characteristics and deployment scenarios of SAB/SAP as utilized in broadcasting
- BT.2382-1: Description of interference into a digital terrestrial television receiver
- BT.2383-1: Characteristics of digital terrestrial television broadcasting systems in the frequency band 470-862 MHz for frequency sharing/interference analyses
- BT.2389-0: Guidelines on measurements for digital terrestrial television broadcasting systems
- BT.2390-1: High dynamic range television for production and international programme exchange

Handbooks:

- "Handbook on Digital Terrestrial Television Broadcasting networks and systems implementation"

ITU-R Recommendations and Reports on the fixed-satellite service[23]

Recommendations:

- S.2099-0: Allowable short-term error performance for a satellite hypothetical reference digital path
- Reports:
- S.2223-1: Technical and operational requirements for GSO FSS earth stations on mobile platforms in bands from 17.3 to 30.0 GHz

ITU-R Recommendations and Reports on radiowave propagation[24]

Recommendations:

- P.311-16: Acquisition, presentation and analysis of data in studies of radiowave propagation
- P.341-6: The concept of transmission loss for radio links
- P.372-13: Radio noise
- P.453-12: The radio refractive index: its formula and refractivity data
- P.525-3: Calculation of free-space attenuation
- P.531-13: Ionospheric propagation data and prediction methods required for the design of satellite services and systems
- P.676-11: Attenuation by atmospheric gases
- P.681-9: Propagation data required for the design of Earth-space land mobile telecommunication systems
- P.684-7: Prediction of field strength at frequencies below about 150 kHz
- P.833-9: Attenuation in vegetation
- P.834-8: Effects of tropospheric refraction on radiowave propagation
- P.841-5: Conversion of annual statistics to worst-month statistics

Reports:

- P.2345-1: Defining propagation model for Recommendation ITU-R P.528-3
- P.2346-1: Compilation of measurement data relating to building entry loss

[23] Res. ITU-R 5-7; WSIS AL C2; SDG Target 9.c

[24] Res. ITU-R 5-7; Res. 238 (WRC-15); WSIS AL C2; SDG Target 9.c

ITU-R Recommendations and Reports on spectrum measurements and spectrum management[25]

Recommendations:

- SM.2093-0: Methods for measurements of indoor radio environment
- SM.2096-0: Test procedure for measuring direction finder sensitivity in the VHF/UHF frequency range
- SM.2097-0: On-site accuracy measurements of a fixed direction finder system

Reports:

- SM.2012-5: Economic aspects of spectrum management
- SM.2256-1: Spectrum occupancy measurements and evaluation
- SM.2351-1: Smart grid utility management systems
- SM.2391-0: The effects of wind turbines on fixed radio direction finders
- SM.2392-0: Applications of wireless power transmission via radio frequency beam

ITU-R Recommendations and Reports on fixed and mobile services[26]

Reports:

- F.2393-0: Use of fixed service for transport of traffic, including backhaul, for IMT and other terrestrial mobile broadband systems
- F.2394-0: Compatibility between P-P applications in the fixed service operating in the 71-76 GHz and 81-86 GHz bands and automotive radar applications in the radiolocation service operating in the 76-81 GHz bands
- M.2014-3: Digital land mobile systems for dispatch traffic
- M.2291-1: The use of International Mobile Telecommunications (IMT) for broadband Public Protection and Disaster relief (PPDR) applications
- M.2395-0: Introduction to railway communication systems in certain countries

ITU-R Recommendations and Reports on the mobile-satellite service[27]

Reports:

- M.2396-0: Use of mobile-satellite service systems for flight tracking
- M.2398-0: Scenarios and performance of an integrated MSS system operating in frequency bands below 3 GHz.

21 Res. ITU-R 5-7; WSIS AL C2; SDG Targets 3.d, 4.7, 5.b, 9.c, 10.2, 11.4, 13.1, 16.7, 16.10

[25] Res. ITU-R 5-7; WSIS AL C2; SDG Targets 7.b, 9.c, 11.6, 11.b16 Report on the implementation of the strategic plan and activities of the Union

[26] Res. ITU-R 5-7; WSIS AL C2; SDG Targets 9.c, 11.2, 11.5

[27] Res. ITU-R 5-7; WSIS AL C2; SDG Targets 9.c, 11.2

R.2-3 Advice from the Radiocommunication Advisory Group

The Radiocommunication Advisory Group (RAG) held its annual meeting to review the priorities and strategies adopted in the Sector, provide guidance for the work of the Study Groups and recommend measures to foster cooperation and coordination with other organizations and with the other ITU Sectors. The outputs of the RAG included:[28]

• Advice to the BR Director on further development of the BR information system, preparations for both the RA and the WRC to be held in 2019, as well as on the working methods of the RA, Study Groups and related groups.

• Advice on the priorities, programmes, operations, financial matters and strategies related to the work of the Sector, on the progress in the implementation of the programme of work, including the four-year rolling operational plan.

• Creation of a Rapporteur Group to follow the software developments undertaken in response to Resolutions 907 (Rev. WRC-15) and 908 (Rev. WRC-15).

175. In the framework of ITU-R Sector and Intersectoral objective number R.3: 'Foster the acquisition and sharing of knowledge and know-how on radiocommunications', the following outcomes and outputs have been achieved:

Outcomes:
R.3-1: Increased knowledge and know-how on the Radio Regulations, Rules of Procedures, regional agreements, recommendations and best practices on spectrum use
R.3-2: Increased participation in ITU-R activities (including through remote participation), in particular by developing countries
Outputs:
R.3-1 ITU-R publications
R.3-2 Assistance to members, in particular developing countries and LDCs
R.3-3 Liaison/support to development activities
R.3-4 Seminars, workshops and other events

Outputs:

R.3-1 ITU-R publications

The dissemination of the outputs produced by the ITU-R regarding the Radio Regulations, Rules of Procedures, Handbooks, ITU-R Recommendations, ITU-R Reports and ITU-R software.[29]

[28] Art. 11A of the CV, Res. ITU-R 52; WSIS AL C2; SDG Target 9.c

[29] Res. 9, 71; WSIS AL C2; SDG Targets 1.4, 9.c, 17.7, 17.8, 17.9, 17.1618 Report on the implementation of the strategic plan and activities of the Union

Radio Regulations (2012 edition) and Rules of Procedure (RoP)

Following the free online access policy adopted by Council, year 2016 resulted in the following number of free downloads:

- 2991 Radio Regulations, RR (2012 edition), from 30 countries.
- 1867 Rules of Procedures, from 43 countries.

Accumulated Radio Regulations numbers (2014-2016) sum 12,166 free downloads made from more than 165 countries and 4,783 sold copies of the Radio Regulations, RR (2012 edition) prior to the publication of RR (2016 edition).

Handbooks on radio-frequency spectrum management

3624 downloads of handbooks were made, the most popular one being the Spectrum Monitoring (44%) followed by the National Spectrum Management (36%).

ITU-R Recommendations and ITU-R Reports

In 2016, more than 829,000 downloads of ITU-R Recommendations (18 series, 1,152 in force) and more than 231,000 downloads of ITU-R Report (13 series, 411 in force) were registered.

Radio Regulations tools

As indicated in section R.1-7 above, the Bureau has developed new software tools to facilitate the use and review of the Radio Regulations. These tools are currently being updated to take into account feedback received and WRC-15 decisions. The navigation tool was made available in its RR-2012 edition from January 2016.

R.3-2 Assistance to members, in particular developing countries and LDCs

BR continued to provide assistance, in particular to developing countries, as follows:[30]

- Provision of support to national spectrum management activities, long-term frequency management for mobile broadband, as well as transition to digital broadcasting and the allocation of the digital dividend (seven countries):
  - Provision of technical assistance (six countries).
  - Individual or group training at ITU headquarters on radio regulatory procedures upon demand from interested administrations (one country).
- Support to the meetings of the regional groups and their initiatives, such as the support to frequency coordination activities in the UHF band in the Caribbean and Central American region, in cooperation with CITEL, COMTELCA and CTU, assistance to the SEDDIF (South Eastern Digital Dividend Implementation Forum).

R.3-3 Liaison/support to development activities[31]

[30] Res. 9, 71; WSIS AL C2; SDG Targets 3.d, 4.7, 5.b, 10.2, 11.4, 12.a,13.1, 16.7, 16.10

[31] Res. 9, 71, 72; WSIS AL C11; SDG Targets 17.7, 17.8, 17.9, 17.16, 17.19

BR continues to fulfil its objective of assisting the ITU membership, in particular developing countries, on matters relating to radiocommunications. For this purpose, BR organizes and participates in many spectrum related workshops, seminars, meetings and capacity building activities. These are carried out in close cooperation with BDT and the ITU regional and area offices, and the relevant international organizations and national authorities.

During 2016, BR has been actively participating in a joint project with BDT to develop a *Spectrum Management Training Programme*.

BR has also strengthened its cooperation with international, regional and sub-regional organizations on topics related to the use of spectrum or radiocommunication services, by organizing, promoting and participating in events towards capacity building. These organizations include APT, ASMG, ATU, CEPT, CITEL, RCC, EBU, ESOA, IEC, GSMA, GSA, GVF, ICTO, ITSO, UNDAC, the CTU (Caribbean Telecommunications Union), PITA (Pacific Islands Telecommunications Association), and the CTO (Commonwealth Telecommunications Organization).

R.3-4 Seminars, workshops and other events

As a complement to the Word Radiocommunication Seminars, BR has implemented, in consultation with the RAG, a strategy for regional outreach through the organization of yearly cycles of Regional Radiocommunication Seminars (RRS), held in different regions worldwide, fostering human capacity building on the use of the radio-frequency spectrum and the satellite orbits, and, in particular, the application of the provisions of the ITU Radio Regulations. These seminars are hosted by the entity in charge of spectrum management in the host country, in cooperation with the relevant regional organizations and the ITU regional/areas offices.

42 full fellowships and 10 partial fellowships have been granted by BR for RRS and WRS participants of eligible countries.

All workshops and events organized by BR in 2016 can be found at: http:// www. itu. int/ ITU- R/ go/ seminars.[32]

The new cycle of events after WRC-15, included, in particular:

- WRS-16: 453 participants from 109 countries
- Two RRS-16: 104 participants from 21 countries (RRS-16 Americas and RRS-16 Asia & Pacific with 36 participants from 11 countries and 68 participants from 10 countries respectively)
- Total: 3 seminars, 557 participants from 131 countries

Other events organized by BR included Satellite Symposiums and the Internet of Things Workshop.

On 12 December 2016 in Geneva, ITU celebrated the 110th anniversary of the Radio Regulations. Details can be found in document C17/13

[32] Res. 9, 71, 72; WSIS AL C4, C11; SDG Targets 1. 4, 1. 5, 2. 3, 3. d, 4. b, 13. 1, 17. 7, 17. 8, 17. 9, 17. 16, 17. 19

Action Line C5: Building Confidence and Security in the use of ICTs (also related to the 2030 Agenda for Sustainable Development)

Related to SDGs: SDG 1 (1.4), SDG 4 (4.1, 4.3, 4.5), SDGs 5 (5.b), SDGs 7 (7.1, 7.a, 7.b), SDG 8 (8.1), SDGs 9 (9.1, 9.c), 11.3, 11.b, 16.2, 17.8

176. A fundamental role of the ITU, following the WSIS Summit and the 2006 ITU Plenipotentiary Conference, is to build confidence and security in the use of ICTs.

177. The 12th Action Line C5 facilitator's meeting was held as an integral component of the WSIS Forum 2017, on Thursday 15 June 2017. The theme of this year was "AL C5. Measuring Cybersecurity ", focusing on the need for reliable metrics to adequately measure progress in the Cybersecurity domain. During the session the official launch of the new iteration of the Global Cybersecurity Index (GCI) also took place. The outcome of the meeting is available here: https://www.itu.int/en/itu-wsis/Documents/wf17/WSISForum2017_ForumTrackOutcomes.pdf

178. Cybersecurity and Countering Spam Activities:

a) The Global Cybersecurity Agenda (GCA) provides a framework within which an international response to the growing challenges to cybersecurity can be addressed. Resolution 130 (Rev. Busan, 2014) clearly endorses the GCA as the ITU-wide strategy on Cybersecurity.

b) Within ITU, the GCA shows the complementary nature of existing ITU work programmes and facilitates the implementation of BDT, TSB and BR activities in this domain. The GCA is built upon five strategic pillars or work areas around which its work is organized: (1) Legal Measures, (2) Technical and Procedural Measures, (3) Organizational Structures, (4) Capacity Building and (5) International Cooperation.

1) Legal Measures (SDG 7 (7.1, 7.a, 7.b), SDG 9 (9.1, 9.c), SDG 11 (11.3, 11.b) , SDG 16 (16.2), SDG 17 (17.8))

179. As part of Objective 2/Output 2.2 of the Buenos Aires Action Plan, and taking into account ITU-D Q 3/2 (former Q22/1), ITU is assisting Member States in understanding the legal aspects of cybersecurity through its ITU Cybercrime Legislation Resources in order to help harmonize their legal frameworks.

180. In the area of legal measures, ITU collaborates closely with partners such as UNODC and others that may have expertise in this area.

2) Technical and Procedural Measures (SDG 1 (1.4), SDG 7 (7.1, 7.a, 7.b), SDG 9 (9.1, 9.c), SDG 11 (11.3, 11.b), SDG 17 (17.8))

181. In order to identify cyberthreats and countermeasures to mitigate risks, ITU-T has developed Recommendations of security requirements, guidelines and specifications for ICT and IP-based systems. ITU-T also provides an international platform for the development of the protocols, systems and services that protect current and Next Generation Networks (NGN). ITU-T's work on secure communication services, reviews enhancements to security specifications for mobile end-to-end data communications and considers security requirements for web services and application protocols.

182. ITU-T Study Group 17 (SG17) is the lead study group on security and identity management with its role being reinforced by WTSA-16 Res. 50 and 52. SG17 is also working on the implementation of WTSA-12 Res. 58 to "Encourage the creation of national Computer Incident Response Teams, particularly for developing countries" and is following Resolution 130 of the Plenipotentiary Conference. Since September 2017, Study Group 17 has continued its responsibility for building confidence and security in the use of information and communication technologies (ICTs). Study Group 17 established a new Question 14/17 on security aspects of distributed ledger technologies and continues to be instrumental in study and standardization in the area of intelligent transport system security, cybersecurity, countering Instant Messaging Spam, identity management, X.509 certificates, information security management, telebiometrics, mobile security, personally identifiable information protection, virtualization security towards cloud computing security, and security architecture and application security, often in cooperation with external SDOs and Consortia.

183. The ITU-T Focus Group on Application of Distributed Ledger Technology (FG DLT) was established in May 2017 to identify and analyse DLT-based applications and services; to draw up best practices and guidance which support the implementation of those applications and services on a global scale; and to propose a way forward for related standardization work in ITU-T Study Groups. FG DLT will develop a standardization roadmap for interoperable DLT-based services, taking into consideration the activities underway in ITU, other standards developing organizations, forums and groups.

184. **ITU-T SG17 approved in 2016 the 8th edition of the ITU-T X.500 series Recommendations "Information technology - Open Systems Interconnection - The Directory"** including **ITU-T X.509 (revised, 8th edition) "Information technology - Open Systems Interconnection - The Directory: Public-key and attribute certificate frameworks"** which defines frameworks for public-key infrastructure (PKI) and privilege management infrastructure (PMI), and specifies the following data types: public-key certificate, attribute certificate, certificate revocation list (CRL) and attribute certificate revocation list (ACRL). It also defines several certificates and CRL extensions, and it defines directory schema information allowing PKI and PMI related data to be stored in a directory. Work toward 9th edition of ITU-T X.500-series Recommendations is ongoing.

185. **Recommendation ITU-T X.1040 "Security reference architecture for lifecycle management of e-commerce business data"** analyses the main features and typical threats faced by e commerce service ecosystems, and provides a security reference architecture for lifecycle management of e-commerce business data.

186. **Recommendation ITU-T X.1053 "Code of practice for information security controls based on ITU-T X.1051 for small and medium-sized telecommunications organizations**" establishes guidelines and general principles for initiating, implementing, maintaining, and improving information security controls in small and medium-sized telecommunications organizations (SMTOs) based on ITU-T X.1051. This Recommendation also provides an implementation baseline of information security controls for SMTOs to ensure the confidentiality, integrity and availability of telecommunication facilities and services and information handled, processed or stored by the facilities and services.

187. **Recommendation ITU-T X.1127 "Functional security requirements and architecture for mobile phone anti-theft measures"** focuses on the functional security requirements and functional architecture for smartphone anti-theft mechanisms based on the general requirements described by the GSMA. Smartphones are rapidly proliferating and have become a nearly indispensable part of daily life. Unfortunately, many smartphone users have had their phones stolen. A smartphone anti-theft measure, i.e., a kill switch tool, for use in the event it is lost or stolen, should provide the capability to:

- remotely delete the authorized user's data that is on the smartphone;
- render the smartphone inoperable to an unauthorized user;
- prevent reactivation without the authorized user's permission to the extent technologically feasible; and
- reverse the inoperability if the smartphone is recovered by the authorized user, and restore user data on the smartphone to the extent feasible.

188. **Recommendation ITU-T X.1146 "Secure protection guidelines of for value-added services provided by telecommunication for operators"** provides secure protection guidelines for value-added services provided by telecommunication operators. In addition to analysing typical service scenarios, security threats and attack methods, this Recommendation provides technical measures to counter threats and attacks. This will help the operators to assure the security of the value-added service, and will also protect the users' benefits.

189. **Recommendation ITU-T X.1213 "Security capability requirements for countering smartphone-based botnets"** analyses the background and potential security threats of smartphone-based botnets, and provides security capability requirements. Along with the rapid development of mobile Internet devices and the widespread use of smartphones, surveys from worldwide organizations show that botnets, formerly targeting mostly personal computer (PC)-based networks, are now being replicated very quickly on smartphones. Currently, countries and regions with differing conditions and ecosystems have varying levels of constraints on the propagation of smartphone-based botnets. Analytical reports from various security companies and investigative organizations show noticeably different statistical data on the severity of the propagation of smartphone-based botnets. The potential threat of smartphone-based botnets is increasing very quickly in some regions and could possibly spread worldwide and turn from a regional issue into a serious global issue. Compared with PCs and servers, smartphones have less processing power, storage space and battery life. However, the adversarial influence of smartphone-based botnets could have greater repercussions on users for the following reasons: 1) smartphones often store very important personally identifiable information (PII) and 2) if

attacks on smartphones or on the operator's infrastructure occur, user experience may degrade significantly due to the prevalence of, and user dependence on, smartphones.

190. **Recommendation ITU-T X.1214 (revised) "Security assessment techniques in telecommunication/ICT networks"** (under approval) describes global security assessment methodology and best practices for developers, manufacturers, operators and individual security experts of the telecommunication domain. Both the traditional circuit-switched networks and the packet-based networks are exposed to different threats and attacks - from external as well as internal sources - that target the various parts of the telecommunications/ICT network. This Recommendation covers the following:
- Detection of vulnerabilities in telecommunications/ICT network
- Methodology of security assessment in telecommunications/ICT network.

191. **Recommendation ITU-T X.1248 "Technical requirements for countering instant messaging spam"** identifies characteristics of spam over instant messaging (SPIM) and specifies technical requirements for countering it. As instant messaging (IM) increases in popularity, the proliferation of SPIM becomes an increasingly serious problem. The characteristics of IM, such as being Internet protocol (IP)-based with widespread usage that is free of charge, potentially allows SPIM to spread widely and uncontrollably. If SPIM problems are not carefully addressed, they can have negative impacts on the utilization of the IM service itself.

192. **Recommendation ITU-T X.1331 "Security guidelines for home area network (HAN) devices in smart grid systems"** (under approval) will provide threat analysis of the HAN in the smart grids, security requirements, and security functions. Since the role and functions of each HAN device are different, the security requirements and security functions by devices are provided.

193. **Recommendation ITU-T X.1541 (revised) "Incident object description exchange format version 2"** describes the information model for the incident object description exchange format (IODEF) version 2 and provides an associated data model specified with XML schema. The IODEF specifies a data model representation for sharing commonly exchanged information about computer security or other incident types. This is achieved by listing the relevant clauses of IETF RFC 7970 and showing whether they are normative or informative.

194. **Recommendation ITU-T X.1603 "Data security requirements for the monitoring service of cloud computing"** (under approval) analyses data security requirements for the monitoring service of cloud computing which include monitoring data scope requirements, monitoring data lifecycle, security requirements of monitoring data acquisition and security requirements of monitoring data storage. Monitoring data scope requirements include the necessary monitoring scope that cloud service providers (CSPs) should provide to maintain the cloud security and the biggest monitoring scope of CSPs. Monitoring data lifecycle includes data creation, data store, data use, data migrate, data present, data destroy and data backup. Monitoring acquisition determines the security requirements of the acquisition techniques of monitoring service. Monitoring data storage determines the security requirements for CSPs to store the monitoring data.

195. **ITU-T X.Suppl.29 "Guidelines on countermeasures against short message service (SMS) phishing and smishing attack"** provides universal guidelines on short message service (SMS) phishing which is a fraudulent technique through mobile phones by causing phishing frauds with smartphones, acquiring personal information on the smartphones, or by enabling small amounts of money to be approved and paid while the account holder is not aware of the approval. The purpose of this Supplement is to universalize the guideline for countermeasures against SMS phishing incident by defining a security guideline about security technology against SMS phishing incident and method, and specification of report contents.

196. **ITU-T X.Suppl.30 "Security guidelines for mobile virtual network operators"** provides security guidelines for mobile virtual network operators (MVNOs). Security is very important to MVNOs and most MVNOs have a lot of security similarities. This Supplement analyses the main features of MVNOs and the typical security threats that they face. Based on the structure of MVNOs, this Supplement provides a security framework for MVNOs, including security objectives and security requirements.

197. **ITU-T X.Suppl.31 "Supplement on guidelines for using object identifiers for the Internet of things"** provides guidelines on how to use object identifiers (OIDs) to identify objects in the Internet of things (IoT). It includes guidelines on how to structure OIDs, how to implement resolution systems and how to establish management procedures based on existing ITU-T Recommendations and International Standards.

198. An ITU Workshop on Security Aspects of Blockchain in Geneva, 21 March 2017, examined blockchain's potential to build trust into a wider variety of our interactions online. Technical sessions assessed the status of blockchain technology and its application, focusing on blockchain use-cases supporting security, privacy and trust. The workshop explored the surrounding policy and regulatory environment. An expert roundtable brought together representatives of industry associations and standards bodies to identify where ITU-T SG17 could contribute to further standards collaboration in support of blockchain.

199. The ITU Workshop on Security Aspects of Intelligent Transport Systems in Geneva, 28 August 2017, discussed the security requirements of all actors in the value chain underlying intelligent transport systems (ITS), encouraging an ecosystem view of the ITS security challenge. The event analyzed a variety of high-profile ITS security breaches, using these case studies to demonstrate a ream of security vulnerabilities in the ITS environment. One of the workshop's key priorities was to consider where standards collaboration could be improved among SAE, ISO and ITU's standardization arm (ITU-T), as well as where ITU could enhance its productive collaboration with UNECE WP.29, the body responsible for global vehicle regulations.

200. ITU-T Study Group 13 is progressing the work on inter-cloud trust management.

Recommendation ITU-T Y.3051 "The basic principles of trusted environment in ICT infrastructure" is devoted to the issue of creating trusted environment in ICT infrastructure providing information and communication services. The Recommendation provides the definition, common requirements and the basic principles of creating trusted environment.

Recommendation ITU-T Y.3052 "Overview of trust provisioning for ICT infrastructures and services" provides an overview of trust provisioning in ICT infrastructures and services. It introduces necessity of trust to cope with potential risks due to lack of trust. The concept of trust provisioning is explained on the trusted ICT infrastructures and services. From the general concept of trust, the key characteristics of trust are described. In addition, the trust relationship model and trust evaluation based on the conceptual model of trust provisioning are introduced. Finally, it describes trust provisioning processes in ICT infrastructures and services.

Recommendation ITU-T Y.3514 "Cloud computing - Trusted inter-cloud computing framework and requirements" specifies a framework of trusted inter-cloud computing and relevant use cases. It provides general requirements for trusted inter-cloud and specific ones related to governance, management, resiliency and security and confidentiality of trusted inter-cloud.

201. Question 6 of ITU-T Study Group 20 is working on "Security, privacy, trust and identification for IoT and SC&C". ITU-T SG20 approved **Recommendation ITU-T Y.4805 on "Identifier service requirements for the interoperability of Smart City applications"**. This Recommendation explores the set of requirements for identifier services used in Smart City. An identifier service for Smart City must be scalable and secure, and not only promote interoperability among different Smart City applications, but also compatible with any existing practices in the application domain. **Recommendation ITU-T Y.4806 "Security capabilities supporting safety of the Internet of Things"** (under approval) provides a classification of the security issues for the Internet of Things and examines how the security threats may affect safety, in order to determine which security capabilities specified in Recommendation ITU-T Y.4401/Y.2068 support safe execution of the Internet of Things. The Appendixes of this Recommendation consider how the joint analysis of threats and security capabilities mentioned herein may be used to establish security requirements for the different applications of the Internet of Things.

202. ITU-R's work in radiocommunication standardization continues, matching the constant evolution in modern telecommunication networks. ITU-R established clear security principles for IMT (3G, 4G and 5G) networks (Rec. ITU-R M.1078, M.1223, M.1457, M.1645, M.2012 and M.2083). It has also issued Recommendations on security issues in network management architecture for digital satellite systems (Rec. ITU-R S.1250) and performance enhancements of transmission control protocol over satellite networks (Rec. ITU-R S.1711). Futuristic mobile technologies foresee "IMT for 2020 and beyond", please read more here: https://www.itu.int/en/ITU-R/study-groups/rsg5/rwp5d/imt-2020/Pages/default.aspx

3) Organizational Structures (SDG 1 (1.4), SDG 7 (7.1, 7.a, 7.b), SDG 9 (9.1, 9.c), SDG 11 (11.3, 11.b), SDG 17 (17.8))

203. BDT is working with Member States, regions, and with partners, to deploy capabilities to build capacity at national and regional levels through the establishment of National Computer Incident Response Teams (CIRTs).

204. To date, 68 countries have received assistance in assessing their national cybersecurity preparedness and response capabilities. An assessment exercise is typically conducted during a five-day on-site visit, which also includes an initial workshop to provide an appreciation of cybersecurity issues at national level and to better understand the

operations of a national CIRT. The ensuing analysis and report elaboration are done off site, culminating in a final report submitted to the country. This document is essentially a customized, detailed roadmap for implementing the country's national CIRT.

205. Thirteen countries (Barbados, Burkina Faso, Côte d'Ivoire, Cyprus (Governmental CIRT), Ghana, Jamaica, Kenya, Macedonia, Montenegro, Tanzania, Trinidad and Tobago, Uganda, and Zambia) have availed themselves of ITU support to set up a national computer incident response team, and four others (Burundi, Gambia, Palestine and Zimbabwe) are currently receiving assistance to do likewise. National CIRT implementation can be undertaken in 11 months if the country is fully engaged at all times.

206. To ensure that the national CIRTs are effective in managing incidents in harmony with international standards and good practice, and to foster technical-level cooperation between national CIRTs, cyberdrills are conducted at a regional level. A cyberdrill is a multi-day event comprising a workshop for an unlimited number of participants, followed by a two-day simulation of attack exercise for the technical staff of national CIRTs. To date, 18 such cyberdrills have taken place with the participation of over 100 countries. In 2016 the ITU conducted three Cyberdrills: a) from 4 to 8 April 2016 in Mauritius for the Africa region, b) from 23 to 27 May 2016 in Tunisia for the Arab Region, and c) from 27 June to 1 July 2016 in Quito, Ecuador for the Americas Region. In 2017, twoCyberdrill eventswere held: a) on 13-17 November 2017 in Dar Es Salaam, Tanzania, for both the Africa and Arab Regions and c) on 21-23 November 2017, in Chisinau, Moldova for both the Europe and CIS Regions.

207. The Oman regional cybersecurity centre has been operational since 2013 and has successfully undertaken capacity building, organizing 20 events and assisting 7 countries in the region. Work is ongoing with regard to bringing in international training institutions with a view to providing cybersecurity training through the ITU Academy.

208. A National Cybersecurity Strategy toolkit is under development, as a multistakeholder effort facilitated by ITU. To progress the work, three partner workshops were held on 18-19 February 2016 at the ITU HQs in Geneva, Switzerland, on 6-7 June 2016 at the Saïd Business School of the University of Oxford, United Kingdom, and on 13-14 October 2016 in Washington DC, United States, hosted by the Organization of American States (OAS). The product is currently under finalization.

4) Capacity Building (SDG 1 (1.4), SDG 7 (7.1, 7.a, 7.b), SDG 9 (9.1, 9.c), SDG 11 (11.3, 11.b), SDG 17 (17.8))

209. Within the framework of GCA, ITU facilitates the implementation and deployment of cybersecurity capabilities that is necessary to combat cyberthreats.

210. ITU has organized, co-organized, and has participated in various human capacity-building forums: a) A workshop on "Cybersecurity strategy in African countries" was jointly organized by ITU and ATU with the support of TSB and BDT on 24-26 July 2016 at the National Telecommunication Corporation (NTC) headquarters in Khartoum, Republic of Sudan; b) The 4th edition of the "Central European Cybersecurity Public-Private Dialogue Platform" was held from 14 to 16 September 2016 in Sibiu, Romania; c) A Workshop on "CIRT services and set up process for African Countries without CIRT" was held on 10-12 October 2016, in Conakry, Guinea; d) A Regional Cybersecurity Summit and FIRST Arabic and African Regional Symposium was held from 30 October to 3 November 2016, in Sharm El Shiekh, Egypt; e) For the first time, ITU formally partnered with the European Network and Security Agency (ENISA) to organize a joint ITU-ENISA Regional Cybersecurity Forum on 29-30 November 2016 in Sofia, Bulgaria; f) An ITU-AICTO Regional Workshop on "Policy Advocacy on Data Privacy & CyberSecurity" was held on 5-6 December 2016, in Tunis, Tunisia; g) An ITU "Workshop on Cybersecurity and Risk assessments in Practice" was held on 26 January 2017, in Geneva, Switzerland.

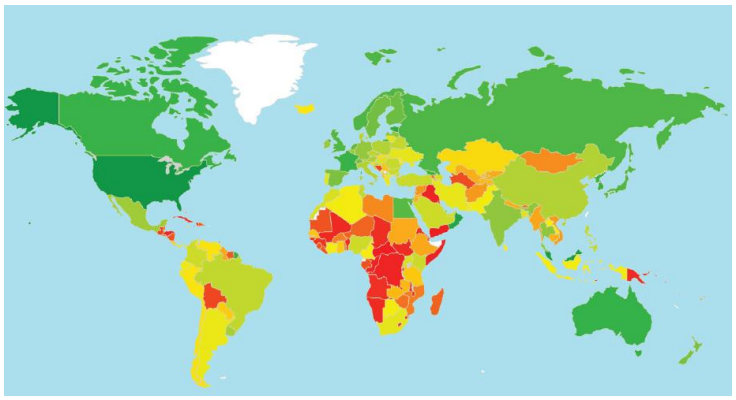
211. Training courses in cybersecurity are being identified, and discussions have been initiated with a view to providing courses through the ITU Academy. To facilitate regional training in cybersecurity, the ITU Centre of Excellence Global network has endorsed five training institutions; namely two in the Africa region, one in Asia-Pacific and two in Europe. These institutions have been conducting training in Cybersecurity as part of their regional training plans under the Centres of Excellence initiative.

212. The cybersecurity needs of the least developed countries (LDCs) are the focus of particular attention under ITU's "Enhancing Cybersecurity in Least Developed Countries" project. This project focuses on assisting the LDCs to enhance their capabilities, capacity, readiness, skills and knowledge in the area of cybersecurity. Apart from human capacity building, the project is also geared towards providing the appropriate enabling technologies and related tools to assist LDCs in carrying out activities with regard to securing their cyberspace.

213. To date, the project has been implemented in Sierra Leone, Republic of Guinea, Djibouti, Comoros and Vanuatu, and is at different stages of implementation in Afghanistan, Angola, Bhutan, Burundi, Chad, Haiti, Kiribati, Lao, Mauritania, Myanmar, Rwanda, Tanzania, Uganda and Zambia. Given the strong interest of Gambia in enhancing its cybersecurity capabilities, the project in Gambia has been augmented to a national CIRT establishment.

214. ITU provided direct country assistance to Lao PDR on drafting its National Cybersecurity Policy. ITU assisted Nepal in creating Cybersecurity awareness for the Ministry, regulator, industry and relevant stakeholders including child online protection. ITU assisted Afghanistan in delivering penetration testing training for professionals of Afghanistan CERT to build their capability.

215. In Myanmar, Vietnam, Lao PDR, and Cambodia, in 2016, ITU helped develop technical skills to assist Incident Responders.



216. Capacity Building also implies having factual information about the state of cybersecurity readiness at a national and international level. Work was completed on the second version of the Global Cybersecurity Index (GCI), following the publication of the 2014 results and its inclusion in Resolution 130 (Rev. Busan, 2014), based on responses from 134 countries, and with the assistance of international partners.

217. ITU-T SG17 in its March 2017 meeting supported the proposal to create a Regional Group for Arab Region (SG17RG-ARB). The first meeting of SG17RG-ARB was organized on 10 December 2017 in Muscat, Oman followed by the first Arab-African Interregional Standardization Forum (ISF) for Bridging the Standardization Gap with a focus on PKI for e-trust in the hyperconnected world, held on 11-12 December 2017.

5) International Cooperation (SDG 1 (1.4), SDG 7 (7.1, 7.a, 7.b), SDG 9 (9.1, 9.c), SDG 11 (11.3, 11.b), SDG 17 (17.8))

218. The GCA is based on international cooperation and strives to engage all relevant stakeholders in a concerted effort to build confidence and security in the use of ICTs.

219. BDT has consolidated its global alliance with governments, academia and industry experts to promote a culture of cybersecurity awareness and a holistic approach to counter misuses of online networks. An active partnership with the UNODC, ENISA, Oxford University, Symantec, Trend Micro, the Commonwealth Cybercrime Initiative (CCI), the Commonwealth Telecommunication Organisation (CTO), Nuix and INTERPOL is maintained. Collaboration with FIRST, the biggest association of CIRT teams, is well established, with the FIRST affiliation for attending CIRTs in ITU cyberdrills being facilitated and subsidized. As well, ITU contributes to the development of a Services Framework for CIRTs under FIRST's leadership, which will be used in BDT's CIRT program.

220. A Memorandum of Understanding with the Economic Community of West African States (ECOWAS) was signed on 8 June 2015 to provide a framework for collaboration on cybersecurity in the region.

221. We are currently working on upcoming collaboration with CERT regional groups namely AfricaCERT, APCERT and OIC CERT. These collaboration will synergise our activities in the regions and will enhance CERT specific knowledge exchanges between regions.

222. During the Global Conference on Cyberspace (GCCS) held in The Hague, Netherlands, in April 2015, the Global Forum on Cyber Expertise (GFCE) was launched. The forum now comprises 50 Members participating in 12 initiatives. ITU is a co-initiator of the "CSIRT Maturity Initiative", along with the Netherlands, the Organization of American States (OAS) and Microsoft. The objective of the cybersecurity CSIRT Maturity Initiative is to provide a platform to GFCE members to help emerging and existing Computer Security Incident Response Teams (CSIRTs) increase their maturity level. This activity also contributes greatly to ensuring BDT's CIRT program makes use of all existing resources from the wider community and helps ensure an approach to CIRT capacity building that is well coordinated at the global level. Expert workshops were held alongside the FIRST Technical Colloquium in Prague in January 2016 and the FIRST Annual Conference in Seoul in June 2016. A third expert workshop is being planned for October 2016.

223. During the ITU Plenipotentiary Conference 2014, a letter of agreement was signed between BDT and ISOC on joint activities related to combating the proliferation of spam. Following this agreement, ITU and ISOC organized joint workshops during the 2015 and 2016 WSIS Forums on "Collaborative Internet Security: Best Practices in Addressing Spam and Establishing CSIRTs" and "Spam: Understanding and Mitigating the Challenges Faced by Emerging Internet Economies".

224. BDT is also actively participating in the London Action Plan (LAP). The purpose of this Action Plan is to promote international spam enforcement cooperation and address spam-related problems, such as online fraud and deception, phishing, and dissemination of viruses. LAP and BDT are discussing joint initiatives aimed at improving information exchange.

6) The Child Online Protection (COP) Global Initiative (SDG 4 (4.1, 4.5) and SDG 16 (16.2))

225. Within the framework of the GCA, the Child Online Protection (COP) Initiative was established by ITU as an international collaborative network for action to promote the online protection of children worldwide.

226. ITU has been raising awareness on COP issues through organizing workshops, strategic dialogues and regional forums, holding several workshops at different international conferences and leading or participating in different projects.

227. The ITU CWG COP is holding regularly the online consultation with youth in coordination with a platform called Re-Rights. The first results were very positive and numerous partners got engaged and participated to the consultation.

228. The ITU-CHI joint campaign on Partnering to Protect Children is continuing to give excellent results. The selected case studies received from the online consultation launched in May 2016: were then presented during the ITU Telecom World 2016, in November, and new ways to develop the child helpline services were shared with the participants.

229. In June 2017, ITU together with UNICEF organized a thematic workshop titled *From Child Online Safety to Digital Inclusion: The Role of Global Multistakeholder Partnerships.* The session discussed child participation in the decision making discussions and the importance to use a common agreed terminology to identify gaps and action measures.

230. ITU also participated in the seventh Regional Consultation and Third Policy Dialogue of Child Helplines in Europe. The need to have a regional and harmonized number for child helplines was expressed by several members and more action from policy makers and regional institutions was encouraged.

231. ITU recently participated to the Aqdar World Summit hosted in Abu Dhabi, UAE, on 21-23 November 2017. The meeting discussed several issues related to the role of moral education in academic institutions regionally and internationally to combat global challenges. ITU presented the work of the CWG-COP and the need to educate young children to use technologies in a safe and responsible manner.

Action Line C6: Enabling Environment (also related to the 2030 Agenda for Sustainable Development)

Related to the SDGs: SDG 2 (2.a), SDG 4 (4.4), SDG 5 (5.b), SDG 8 (8.2, 8.3), SDG 9 (9.1, 9.c), SDG 10 (10.3), SDG 11 (11.3, 11.b), SDG 16 (16.3, 16.6, 16.7, 16.10, 16.b), SDG 17 (17.6, 17.14, 17.16)

232. Recognizing the strong commitment of ITU's work towards bridging the digital divide in the area of the enabling environment, UNDP officially handed over the lead facilitation role on WSIS Action Line C6 Enabling Environment to the ITU in May 2008. Since then, ITU has been acting as the sole facilitator for this Action Line building upon its regular work carried out within the three sectors framework of the ITU-D Programme 3: Enabling Environment.

233. **ITU carries out several activities directly related to WSIS Action Line C6**, through projects such as the ones listed below. More information on these projects as well as the other projects can be found on the ITU-D Projects webpage (http://www.itu.int/en/ITU-D/Projects/Pages/default.aspx).The 12th Action Line C6 facilitation meeting was held as an integral component of the 2017 WSIS Forum, on Thursday 15 June 2017. The theme of this year was: "Enabling Environment – The Regulatory Wheel of Fire: Collaborative Regulation to Leverage ICTs for SDGs", where the seismic shift moving countries through Generations 1, 2, 3 and 4 of Regulations was illustrated, seeing generation 5 on the near horizon as open, collaborative, flexible and consensus-based. The outcomes of the meeting are available here: https://www.itu.int/en/itu-wsis/Documents/wf17/WSISForum2017_ForumTrackOutcomes.pdf

234. ITU also organized a session at the WSIS Forum in 2017 on policies and standards for the public procurement of accessible ICTs.

235. ITU announced the WSIS Prizes: winning projects for 2017 during the 2017 WSIS Forum. The prize winner for Action Line C6 was Egypt's National Program for ICT Accessibility in Education for Persons with Disabilities, Ministry of Communications and Information Technology, Arab Republic of Egypt.

236. WRC-19 (World Radiocommunication Conference 2019) preparation: The first session of the Conference Preparatory Meeting for WRC-19 (CPM19-1) was held from 30 November to 1 December 2015 to organize the preparatory studies for WRC-19, based on the WRC-19 Agenda prepared at WRC-15 and taking into account relevant WRC-15 resolutions calling for urgent and other ITU-R studies to be reported by the Director at WRC-15.

237. ITU continues to assist Member States and Sector Members in **developing pro-competitive policy and regulatory frameworks for telecommunications**. More specifically, through Objective 2/1: Policy and Regulatory frameworks, ITU has undertaken numerous activities that foster the development of an enabling environment worldwide including information sharing, creation of tools for effective regulation, national and regional assistance, and creation of training materials and opportunities. Within this context, ITU convenes global and regional forums to discuss global trends in regulation, as well as strategic dialogues on topical policy, legal, regulatory, economic and financial issues and market developments. ITU also provides data, research and analysis and tools to support the definition, elaboration, implementation and review of transparent, coherent and forward-looking strategies, policy, legal and regulatory frameworks and evidence-based decision-making. ITU also provides knowledge exchange tools and platforms to enable inclusive dialogue and enhanced cooperation to help countries achieve a more inclusive information society and to raise national and regional awareness about the importance of an enabling environment, and provides direct assistance to countries and regions on an enabling environment for smart connected societies. Examples of projects are listed below. Enhanced capacity in the Asia and the Pacific region, for example, was the result of training, workshops, seminars, forums, and direct country assistance for the benefit of more than 800 participants from 38 Member States from June 2014 to December 2016.

238. ITU-**D data, research, and analysis and publications on cutting-edge policy, regulatory, and economic issues** include:

- The 2017 Global Regulatory Outlook was launched in 2017 (executive summary available at http://www.itu.int/en/ITU-D/Regulatory-Market/Pages/Outlook/2017.aspx) - a first report in a new annual series tracking market and regulatory trends in the ICT sector and their implications across the economy.
- A new report on Maximizing availability of international connectivity in developing countries: Strategies to ensure global digital inclusion was published. Furthermore, ITU is carrying out a project to foster affordable access to the digital world by providing stakeholders with a platform to identify the

appropriate policy, regulatory, technical and commercial measures to achieve affordable access to international bandwidth. The aim of the project is to strengthen cooperation at the global level, bringing together fiber optic communication stakeholders, as well as policy makers and regulators to identify measures to address the main bottlenecks, strengthen commercial agreements and regulatory frameworks and thus promote open access to fiber optic communications and associated infrastructure and develop harmonized related model regulation.

- ITU has published a discussion paper on the social and economic impact of digital transformation on the economy were released.
- A series of Reports and White Papers analyzing new business models in a digital economy have been published, with more reports under preparation.
- The study and report of the Broadband strategy for Burundi have been completed and validated in Yaoundé at the end of January 2017 in the ITU Area Office premises in the presence of 6 delegates from the administration of Burundi.
- Validation Meeting for the Broadband Universal Access Study and Household Survey for the Kingdom of Lesotho was held on 23 March, 2017 in Maseru, Lesotho. The final report shall provide policy and strategic guidance for broadband development in the Kingdom.
- ITU-D continues to enhance knowledge-exchange tools and platforms such as the ICTEye, the ICT Regulation Toolkit, and the ICT regulatory knowledge centre;
- ITU has developed a toolkit for ICT innovation policy/governance and ICT innovation ecosystem. This project aims to develop a toolkit for fostering ICT innovation ecosystems as well as fostering ICT innovation policy and governance. The toolkit contains guidelines and best practices for the ICT Innovation policy and governance, and guidelines on developing a vibrant ICT ecosystem with the best practices built on relationship among the stakeholders including policy-makers, regulators, industry and academia as well as innovators.
- The review of the National Broadband Policy and Associated Strategic Implementation Plan for Achieving a Digital Economy for the Republic of Namibia was prepared with technical support from the ITU to align it with the new "Guidelines for the structure of a public policy document" released by the Government of Namibia at the end of 2016. The review was finalized and fully accepted by the Government of Namibia.
- In addition, the ITU Intersectoral International Mobile Roaming (IMR) Resources web portal consolidates in one portal all ITU activities on IMR, and lists activities by other regional and international organizations, as well as

updated information on the initiatives at national, bilateral, regional and international level. It also highlights key findings from ITU publications, studies, research, ITU Study Groups, and data and analysis on IMR from the ITU ICT Eye.

239. Key ITU-D gathers and publishes **regulatory and tariff data to facilitate evidence-based decision making**, that include:

- ITU-D has developed the ICT Regulatory Tracker, a unique data-based tool that covers over 186 countries for a period of nine years, showcasing national, regional, and global regulatory progress. The 2015 edition of the Tracker was updated, and access is facilitated through its release on a new online micro-site, available here: (https://www.itu.int/net4/itu-d/irt/#/tracker-by-country/regulatory-tracker/2015) .

- The 2017 edition of the annual ITU-D questionnaire on regulatory and policy issues was sent out to Membership to help track the evolution of ICT policies and regulation, and will shortly be reflected in the update of the ICT Regulatory Tracker.

    - Website views and downloads of regulatory and financial data from May 2014 to June 2017 culminated in the following outreach with the membership and public: ICT Regulation Toolkit: 478 411 page views; online knowledge centre: 599 717 page views; annual GSR websites: 219 272 page views; publications: Trends in Telecommunication Reform 2014 (edition free of charge): 35 679 online downloads; Telecommunication Regulation Handbook 138 204 online downloads; ITU regulatory and market environment thematic reports: 162 829 downloads; and ICT-Eye: 720 912 page views.

240. ITU-D fosters **key strategic dialogues**, including the Global Symposium for Regulators and the strategic dialogue on International Mobile Roaming, and Economic and Financial Forums, and delivers best practice guidelines on key regulatory and policy issues and approaches.

- The 17th edition of the Global Symposium for Regulators (GSR-17), was themed "Living in a World of Digital Opportunities", and held in Nassau, Bahamas, from 11 to 14 July. GSR-17 attracted close to 400 participants including government ministers, heads of regulatory agencies and C-level industry executives from more than 60 countries. GSR-17 was organized by the International Telecommunication Union (ITU) in collaboration with the Government of The Commonwealth of The Bahamas. Throughout the four-day overall GSR programme, participants acknowledged the importance of collaboration in an environment where digital transformation is sweeping across sectors and fifth generation of ICT regulation is coming of age. Unleashing the potential of collaboration among stakeholders to create an enabling environment for innovation, investment and opportunities for all is essential in an increasingly complex and dynamic ICT ecosystem. The event culminated with the adoption by ICT regulators of a set of best practice guidelines on affordable access to digital services. A series of pre-events took place on 11 July 2017 and the morning of 12 July 2017 including the second

edition of the GSR thematic pre-conference, the Global Dialogue on Digital Financial Inclusion, which focused on the security aspects of digital financial services. The pre-event day also included the Regional Regulatory Associations Meeting (RA) and the 8th Private Sector Chief Regulatory Officers Meeting (CRO).

- ITU is undertaking several activities within its mobile roaming imitative LET'S ROAM THE WORLD. This initiative started with the organization of the LET'S ROAM THE WORLD: The ITU Global Dialogue on International Mobile Roaming in Geneva on 18 September 2015 back to back with the ITU-D Study Groups meetings. The main objective of this initiative is to support Members in the definition and adaptation of best practices and guidelines for all stakeholders around the world on IMR. Collaboration with regional regulatory organizations resulted in draft strategic guidelines on IMR.

- The Global Dialogue on Digital Financial Inclusion (GDDFI) is part of ITU-D's initiative to foster and strengthen collaborative regulation between ICT regulators and regulators from other sectors, focusing this year on the financial sector. GDDFI brings together telecom/ICT and financial regulators from around the world to establish a constructive global dialogue on topical issues of relevance to stakeholders from both sectors. The Global Dialogue provides participants with the opportunity to meet, share views and experiences, discuss synergies and regulatory overlap(s), strengthen cross-sectoral collaboration and identify new regulatory approaches fostering access to digital financial services for all through collaborative regulation. GDDFI complements at high political level the technical work done by the Focus Group on Digital Financial Services. GDDFI 2016 identified policy, regulatory, and business collaborative guiding measures to move forward the digital financial inclusion agenda by building synergies at the national, regional and global levels. The report and guiding measures can be accessed here. GDDFI 2017 focused on the security of digital financial services.

- ITU-D's Chief Regulatory Officers (CRO), its Working Group on DFI in particular, recommended that members together with ITU define activities to collaborate with members and partners to create an enabling legal and regulatory framework for DFI, focusing in particular on collaborative regulatory approaches between both sectors and pilot projects to progress to increase telecommunication/ICT access and innovative solutions for DFI as well as to increase awareness on the importance of collaborative regulation between the financial and telecommunication/ICT sectors and competition authorities.

- The ITU-D Forum on Economics and Finance in ICTs/ Telecommunication for Africa and the TSB-SG3 Regional meeting for Africa were held back-to-back on 30 January to 2 February 2017 at Victoria Falls, Zimbabwe. These meetings were attended by 91 participants from 25 countries and 5 institutions, namely ATU, SADC, ESMT and UPU. The Forum provided a platform at which economical and financial issues affecting the sector in different countries were discussed, and possible solutions were considered.

- Knowledge and best practices on the contribution of ICTs to the UN SDGs 2030 were shared during the ITU/BDT Regional Economic and Financial Forum of

Telecommunications/ICTs for Arab States held in Nouakchott-Mauritania on 17-18 May 2017. The Forum was attended by 85 participants from 6 countries.

- Expert Group Meeting on Smart Grids, held on 28 February 2017 within the framework of the ITU Regional Initiative for Europe on Broadband, gathered more than 30 telecom and energy stakeholders and provided foundations for a study on smart grids to be released in Q2/2017.

- ITU Regional Forum for CIS and Europe on Innovation Capabilities and Growth of ICT Startups, raised awareness of ITU activities in the regions, including the implementation of Regional Initiatives. This forum was attended by 54 participants from 12 countries (Europe and CIS).

- ITU-GSMA Asia-Pacific Digital Societies Policy Forum 2017, held in Bangkok, Thailand, on 8-10 May 2017, in welcomed about 160 participants from over 20 countries in the ASP region. The forum addressed emerging digital services towards the age of 5G.

- In 2016 the FTRA and Working Party on Private Sector issues held in Abidjan, Cote d'Ivoire from 23-25 March 2016 attracted 262 participants from 23 countries that deliberated under the theme "Challenges of regulating in an information society with no boundaries". These meetings concluded with a series of recommendations to all actors of Telecom / ICT and requested the Ministers in charge of the Digital Economy different countries to put this recommendation into practice by among others finding ways to develop the Digital Economy in the continent through adequate support training and innovation, develop the culture of entrepreneurship and the sharing of information and risk appetite which are essential commitments for this purpose. The Regulators were requested to work on the harmonization of roaming to limit additional call charges on roaming, and set a limit retail costs.

- To enhance capacity and expedite the move towards the adoption of a cost based roaming regime in the SADC region, ITU facilitated the International Mobile Roaming Cost Model training in Durban, South Africa on 29th March 2017 attracting 60 delegates from 10 SADC Member States. A glide path towards cost-based IMR rate is currently in place.

- ITU Regional Forum on Consumer Information, Protection and Rights for Africa 2017 held in Cotonou Benin, 14-16 March 2017 with 131 participants from 21 countries including including sector members, academia and number of Consumer Associations in Africa. The Forum provided a platform for sharing experiences and adopted a set of guidelines and recommendations to strengthen partnerships between stakeholders at national and regional level.

- The Quality of Service and Quality of Experience (QoS & QoE) training for the SADC region co-organized with Communications Regulators Association of Southern Africa (CRASA) and hosted by the Botswana Communications Regulatory Authority (BOCRA) in May 2017 attracted 104 participants from eight (8) of the twelve (12) members SADC countries. The set of guidelines and recommendations

to harmonize regulatory practices and tools for QoS & QoE for the SADC region adopted.

- One hundred participants from telecommunication and financial services regulators from the Arab region (two-thirds from financial institutions) built a platform for dialogue on the challenges facing their respective sectors in terms of regulation in mobile money. The opportunities and challenges of mobile payments to stimulate financial services and financial inclusion were discussed during the regional workshop for Arab States on digital financial inclusion held in Sudan, from 24 to 25 August 2016.

- The skills and experiences of participants from countries in the Arab region on changes in the regulatory and operational frameworks were enhanced and their understanding of the impact of technological evaluation on the ICT sector increased through a regional training entitled “Big Challenges for Telecom Operators and Regulators” held in Morocco, from 2 to 4 November 2016.

- Eighty participants attended workshops from 14 countries and built an understanding on over-the-top (OTT) content and Internet-of-Things regulatory and technical issues, during the 2015 and 2016 annual meetings of the Arab Regulators Network (AREGNET).

- Promoted dialogue on affordable access to broadband services, economic and financial issues in a converged broadband environment, and the challenges in the digital ecosystem between participants who attended the ITU Regional Economic and Financial Forum of Telecommunications/ICTs for the Arab States held in Muscat, Oman, from 6 to 7 December 2016.

- Participants from Arab countries discussed and made recommendations on the impact of the App Economy, during The ITU Arab Forum on Future Networks: "Broadband Networks in the Era of App Economy", Tunis - Tunisia, 21-22 Feb. 2017;

- Participants from Arab countries shared knowledge and best practices on the contribution of ICTs to the UN SDGs 2030 during the ITU/BDT Regional Economic and Financial Forum of Telecommunications/ICTs for Arab States, Nouakchott-Mauritania, 17-18 May 2017 attended by 85 participants from 6 countries.

- Regional collaboration on radiocommunication and satellite issues has increased. In particular, 55 participants from 8 CIS countries improved their understanding on how the decisions of the World Radiocommunication Conference (WRC-15) and the Radiocommunication Assembly (RA-15) should be implemented in the CIS countries during an ITU regional workshop held in Yerevan, Armenia from 27 to 29 June 2016.

- Strengthened regional cooperation, information sharing, and discussion on innovation and start-ups in the field of ICT, as well as promoted constructive dialogue between international, regional and national stakeholders was achieved at the ITU Regional Forum for CIS and Europe, which was held in Chisinau,

Moldova from 28 to 29 March 2017 and attracted 54 participants from 12 countries.

- Work in the Europe region strengthened the capacity of 225 stakeholders from around 20 countries through exchange of regulatory practices, at the annual regional regulatory conference hosted by the Agency for Electronic Communications and Postal Services of Montenegro for three years, in 2015, 2016, and 2017. Stakeholders also benefited from the opportunity to review priorities of future actions in the region.

- An experts group meeting in February 2017 on "Future smart grid roll-out" identified future avenues of work on collaborative regulation between the telecommunication and energy sectors and has given rise to possible actions on ICT for energy towards SDG 7: Affordable and clean energy, which has set targets to ensure access to affordable, reliable, sustainable and modern energy for all.

241. **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. ITU-D Study Groups are responsible for developing Reports, Guidelines, and Recommendations based on input received from the membership. The Study Groups examine specific task-oriented telecommunication/ICT questions of priority to developing countries, to support them in achieving their development goals. Relevant questions in ITU-D Study Group 1 include: Q1/1 (broadband), Q2/1 (broadband access technologies), Q3/1 (access to cloud computing services), Q4/1 (economic models and methods), Q5/1 (access to ICTs in rural/remote areas) and Q6/1 (consumer protection). 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. (http://www.itu.int/net4/ITU-D/CDS/sg/index.asp?lg=1&sp=2014)

242. ITU has continued to support the strengthening of the Brazilian National Telecommunications Agency (ANATEL). In the framework of this Project ITU has recently supported Anatel in the development and implementation of its main strategic projects, such as preparing the Agency for Strategic Management, assisting on the Regulatory Model review, dimensioning ANATEL's workforce and its ideal allocation taking into account the strategic and business processes, reviewing business processes and structuring the bases of information, in order to improve the efficiency of the Agency. An ambitious capacity building programme is also being developed under the scope of the Project.

243. ITU kicked off in September 2015 the implementation of a technical cooperation project to review the National Telecommunications Plan that was in force in Paraguay and assisted national authorities with the elaboration of the new NTP for the period 2016-2020 in addition of training the staff of CONATEL as to improve the quality of the services provided in the framework of CONATEL's mandate. The NTP entered in force in March 2016. Another project supports CONATEL in the development of cost modelling and training for Anatel staff.

244. ITU-T SG3 agreed on a Technical Paper on the costs incurred by mobile network operators (MNOs) in their provision of IMR services. This Technical Paper reflects the market's realities and its structure. Most importantly, the paper takes a neutral stance with respect to technologies in service and the individual MNO business model and its business processes. The ITU-T Technical Paper on mobile roaming cost analysis can assist regulators in their efforts to create an enabling environment for fair and affordable tariffs for international mobile-roaming services. The new technical guide is accompanied by an online tool which provides a model to calculate the costs to operators of providing mobile-roaming voice services.

245. International mobile roaming is an important area of work for ITU-T Study Group 3. Recommendation ITU-T D.98 on Charging in international mobile roaming service approved in 2012 recognized that Member States, regulators and consumers continue to express concern about the high level of charges incurred when roaming internationally and especially in the case of 'bill shock' (i.e., a bill which the consumer finds unexpectedly excessive). In 2016, WTSA-16 approved a new international standard, **Recommendation ITU-T D.97 on "methodological principles for determining international mobile roaming rates"**.

246. ITU-T SG3 agreed on a Technical Paper on the Economic Impact of OTTs. This Technical Paper provides technical and policy background to the international community in both developed and developing countries as to the nature and implications of Over-the-Top (OTT) and related online services. The report seeks to provide clear statements on the current state of play, and to identify suitable findings where appropriate.

247. ITU also provides support, assistance and training to developing countries in bridging the standardization gap on ICT technologies. ITU-T has 13 Regional Groups to stimulate effective participation in ITU-T Study Groups and increase the number of quality Contributions from the various regions - five in Africa, three in the Americas, three in the Arab region, and two in the APT region. ITU-T also continues to offer a mentoring programme for new delegates to ITU-T Study Groups. Remote participation is offered during all study group meetings. Closing plenaries benefit from full interpretation.

248. ITU organizes annual Regional ICT Standardization Forums as part of activities under WTSA Resolution 44 on bridging the standardization gap. The Forums discuss current standardization topical issues in ITU-T study groups and focus groups to engage more developing countries in the standardization work and could also feature capacity building on ITU-T Recommendations.

249. An ITU-T Global Portal was launched with special focus on activities in the Africa, Asia Pacific, Arab, and Americas regions.

250. ITU is actively supporting implementation of enabling environment frameworks to promote ICT accessibility for persons with disabilities in line with Output 4.3 of the 2014 World Telecommunication Development Conference and Connect 2020 Target 2.5B. This work includes:

- A series of reports to support decision makers on how to ensure accessible ICT devices and services are widely available in their countries. These publications, available in all 6 official ITU languages and accessible e-book versions, include the following:
    - Model ICT Accessibility Policy Report. This report includes model policy, regulations, codes of conduct and legislation that can be adopted and adapted by ITU Member States based on their priorities (mobile, web, public access center and TV/audio visual media accessibility as well as changes to existing ICT legislation and a model policy for the public procurement of accessible ICTs);
    - Making Mobile Phones and Services accessible for Persons with Disabilities. G3ict-ITU;
    - Making Television Accessible Report. G3ict-ITU,
- **ITU-D Study Group 1**, Question 7/1, Access to telecommunications/ICT services by persons with disabilities and with specific needs**"** Rapporteurs Group meeting was held on 4 April 2016 in ITU-HQ in Geneva. BDT provided capacity building training to the Members on the following topics covered by the Model ICT Accessibility policy report:
    - How to promote accessibility of government websites
    - How to ensure mobile phone devices and services are accessible
    - How to ensure TV/audio visual media accessibility
- ITU continues to develop standards in ITU-T study groups (SGs) to promote accessible ICT technologies: Work on human factors is now reinforced within SG16 after its move from SG2. ITU-T Q24/16 (Human factors related issues for improvement of the quality of life through international telecommunications) and ITU-T Q26/16 (Accessibility to multimedia systems and services) progressed their work on Accessibility and Human factors related issues for improvement of the quality of life through international telecommunications. The ITU Inter-sector Rapporteur Group on Audio-visual Media Accessibility studies topics related to audio-visual media accessibility for all media delivery systems including broadcast, cable, Internet, and IPTV.
- ITU-T SG16 approved new **Recommendation ITU-T F.921 "Audio-based network navigation system for persons with vision impairment"** that specifies key elements of audio-based network navigation systems for persons with vision impairments. Work started to revise ITU-T F.791 with accessibility terms and definitions.
- The **Joint Coordination Activity on Accessibility and Human Factors (JCA-AHF)** is mandated to reinforce cooperation within ITU, other UN agencies and activities, ISO, IEC, regional and national SDOs, industry groups, academia, disability organizations and telecommunication user groups for persons with disabilities, with the aim of increasing standardization experts' awareness of the importance of accessibility to ICTs and the need to mainstream the consideration of accessibility in international standardization efforts.
  JCA-AHF meetings take place at least twice a year with accessibility experts including persons with disabilities, each with TSB-provided teleconference facilities, a tool for remote sharing of documents (Adobe Connect), sign-language interpretation and real-time captioning on request.

- ITU organized a workshop together with G3ict on Inclusive ICTs for Disaster and Emergency Preparedness for Persons with Disabilities and those with specific needs, 12 June 2017 during WSIS Forum. The workshop highlighted the urgent needs of ICT accessibility in emergency situations, to save the lives of those persons (two to four times more likely to get injured or die in case of a disaster), which can be improved by implementing ICT accessibility standards including ITU-T's.
- ITU raised visibility on ICT accessibility policies at a series of events in 2016 including "Inclusive Education and ICTs for All" organized at the UN Palais in Geneva and the Committee on Rights of Persons with Disabilities Geneva in March and the two ITU-T JCA-HFA meetings in 2016; as well as the Seminar on social inclusion of people with disabilities through access to telecommunications" organized by OSIPTEL – during the 53rd meeting of the APEC-Telecommunications and Information Working Group in (Tacna, Peru) in June.
- ITU was a panelist on an M-Enabling Summit 2016 session on public procurement of accessible ICTs on 13 June 2016 and moderated a session on International good practices in promoting ICT accessibility on 14 June 2016 in Washington DC-US. The M-Enabling Summit promotes international exchanges among policy makers, organizations of persons with disabilities and private sector companies involved in developing ICT accessibility policies and programs in their respective countries. ITU also delivered a presentation during the International Briefing on Implementing ICT Accessibility Rules and Standards in Public Procurement, hosted by the US Access Board, the International Disability Alliance and G3ict in Washington on 9-10 June 2016 which highlighted ITU's role in promoting policies for the public procurement of accessible ICTs and raised awareness about ITU's activities in the area of ICT accessibility
- ITU has organized the series of "Accessible Americas - Information and Communication for ALL" events. These events, held in 2014 in Brazil, in 2015 in Colombia and in 2016, from 28-30 November in Mexico, have become one of the key events in the Americas region on the topic of ICT accessibility for persons with disabilities. Through these events Americas region target not only to bring together all stakeholders involved to work together to implement ICT Accessibility Policies but also to raise awareness, provide training, share best practices and track concrete results and progress in this topic.
- ITU will also organize a workshop on development of an ICT-accessibility Policy for the East Africa region. The workshop is organized by the ITU Regional Office for Africa in partnership with East Africa Community (EAC) and hosted by the Communications Authority of Kenya in Nairobi, on the 6th and 7th October 2016. The objective of the workshop is to discuss and develop policy recommendations on ICT accessibility. The policy recommendations will be addressed to policy makers in EAC Member States. It is expected that, upon validation and approval, the policies will then be transposed and implemented at the national level. The recommendations will also constitute a valuable benchmark for replication across Africa.
- ITU has provided ICT accessibility policy advice to Egypt and Peru.
- The ITU annual regulatory survey includes questions on ICT accessibility policies in ITU Member States in order to measure progress in achieving Connect 2020 Target 2.5B.

The survey results show that around 40 out of 193 ITU Member States have an ICT accessibility policy.

- Implementation of Regional Initiatives on ICT accessibility in the ITU regional offices for the Arab states, CIS countries and Europe includes:
    - Raising awareness on the ITU Model TV/Audio visual media policy in Slovenia's national workshop on TV accessibility on 7 December 2015.
    - Making ICTs Accessible and Inclusive for All, a knowledge exchange on ICT accessibility was organized within the framework of the European Regional Initiative on ICT Accessibility with the Israeli Mission in Geneva.
    - Online training on ITU Academy will be provided in 2016 on ICT accessibility policies such as the public procurement of accessible ICTs and accessible TV/audio-visual media.
    - The EUR Regional Initiative is also conducting a survey on accessible TV/audio-visual services provided by ITU members.
    - The ITU ARB Regional Office participated in Egypt's annual ICT for Persons with Disabilities meeting, highlighting the Model ICT Accessibility Policy report.
    - The ITU ARB Regional Office established a regional center for ICT Accessibility for Persons with Disabilities that assists countries in the region in formulating national ICT Accessibility policies in addition to many other activities.
    - The ITU Area Office in Moscow created an Internet Access and Training Centre for visually impaired users (1 working place for a blind users and 2 working places for partially sight users) in suburb Chisinau, Republic of Moldova in partnership with a local blind society and established an Internet access and training centre for persons with disabilities in Belarus within the framework of the CIS Regional Initiative.

(c) Co-facilitator of Action Lines C1, C3, C4, C7, C11 and Partners for C8 and C9.

Action Line C1: The Role of Public Governance Authorities and all Stakeholders in the Promotion of ICTs for Development and Action Line C11: International and Regional Cooperation, (also related to the 2030 Agenda for Sustainable Development)

Related to SDGs: SDG 1, SDG 3 (3.8, 3.d), SDG 5, SDG 10 (10.c), SDG 16 (16.5, 16.6, 16.10), SDG 17 (17.18)

251. In accordance with its mandate, the ITU continues to foster international and regional cooperation on a broad range of activities. ITU conducted several meetings, conferences and symposiums to provide a platform to broaden international dialogue on innovative means in harnessing ICTs for advancing development. In 2017 ITU organized a number of events. Series of regional meetings on private-public partnerships as a solution to address the needs of regions for digital technology deployment were organized. At the occasion of

the WSIS 2017, several meetings were organized by BDT for various Action Lines offering platforms for discussion, networking and collaboration for stakeholders on projects and initiatives to promote of ICTs for Development. The 12th Action line Facilitation meeting of C1 and C11 was held on Thursday 15 June 2017 on the topic of "The Role of Private Sector in Mobilizing ICTs for SDGs ". There were many debated issues, such as break-through innovations and investment in ICT most urgently needed in order to accelerate progress towards the SDGs; ICT trends or innovations that have the greatest risk for the SDGs; critical immediate measures governments need to take to engage the private sector in mobilizing ICTs for realizing the SDGs; and role of private sector in ensuring that the benefits of ICTs reach the poorest and most vulnerable. Please read the outcomes here: https://www.itu.int/en/itu-wsis/Documents/wf17/WSISForum2017_ForumTrackOutcomes.pdf

252. Under the auspice of WSIS 2017, ITU and ILO launch a "Digital Skills for Decent Jobs for Youth" campaign, as part of the Global Initiative on Decent Jobs for Youth, that aims to foster decent and inclusive employment and entrepreneurship opportunities at country and regional levels. . The campaign will engage with governments, the private sector and other stakeholders in the information and communication technology sector to realize commitments to train young men and women in basic and advanced digital skills as well as to encourage widespread sharing of data on job openings for youth with digital skills. The Global Initiative is the first United Nations system wide effort for the promotion of youth employment worldwide. It represents a unique collaboration platform to join hands – within and beyond the UN system – to tackle the youth employment challenge and assist Member States in targeting a crucial goal of the 2030 Agenda for Sustainable Development. More information at; http://www.itu.int/en/ITU-D/Digital-Inclusion/Youth-and-Children/Pages/Digital-Skills.aspx

253. In a converged ICT ecosystem, in 2017, ITU/BDT continues its efforts to broader its partners base and to promote collaboration with a wide range of global, regional and national stakeholders (from public an private sectors, foundations, multi-/bi-lateral agencies, academia, etc.) from diverse sectors (Multi-Sector Partnership – MSP - e.g. health, finance, e-waste) to support projects' implementation at global, regional and national levels in a wide range of thematics/areas of action (e.g health, finance, climate change and e-waste).

254. The ITU has been contributing greatly to WSIS implementation and follow-up from 2005 to the present. In 2017, ITU, in close partnership with other United Nations agencies and all WSIS stakeholders, has been leading numerous activities worldwide in the field of information and communication technologies for development, these activities are reflected throughout the report. This section will present major and the most significant initiatives fostered by ITU in 2017. ITU presented its vision at the Plenary Session of OECD Ministerial Meeting held in June 2016 in Cancun, Mexico. This was an opportunity to highlighting ITU 'Connect 2020 Agenda' which was universally adopted by ITU's 193 Member States at ITU Plenipotentiary Conference in 2014. This Agenda sets an ambitious global connectivity goals and targets, to which Member States have committed to achieve in collaboration with all stakeholders across the ICT ecosystem.

255. ITU also co-organize ITU-OECD "Innovation Dialogue" during the OECD Ministerial Meeting drawing the attention to the need to strengthen the digital innovation capacity of countries to integrate ICT innovation into their national development agendas – in recognition not just of the digital divide, but a growing innovation divide in particular. Other ITU collaborative platforms were also highlighted such as the UN Broadband Commission for Sustainable Development, which was set up by ITU and UNESCO in 2010, with a refreshed mandate in 2016 to bring it into line with the SDGs.

256. ITU Telecom World 2016 took place from 14-17 November in Bangkok, Thailand. As the global platform for accelerating ICT innovation for social good, it brought together governments, corporates and small and medium enterprises (SMEs) from emerging and developed markets around the world. It combined an exhibition for digital solutions, a forum for sharing knowledge, an Awards programme recognizing excellence and innovation in ICT solutions with social impact and was a networking hub between nations, organizations and individuals. The event focused on the importance of collaboration across the ICT ecosystem to grow the digital economy, and the vital role of SMEs. By accelerating ICT innovation to improve lives faster, ITU Telecom World 2016 aimed to make the world better, sooner. The outcomes are available here: http://telecomworld.itu.int/wp-content/uploads/2016/12/wt16_post_event_report_web.pdf

257. ITU Telecom World 2017 was held from 25-28 September in Busan, Korea. Please read the outcomes and other details here: http://telecomworld.itu.int/.

258. **Advisory Groups for each Sector: Advisory Groups for each Sector meet every year and** review priorities, strategies, operations and financial matters of the Sector. Please see the Advisory Groups for the sectors below:

The Telecommunication Development Advisory Group (TDAG) for the ITU-D. The 21st meeting of the Telecommunication Development Advisory Group (TDAG) took place from 16 to 18 March 2016 at ITU headquarters in Geneva. (Please see http://www.itu.int/en/ITU-D/Conferences/TDAG/Pages/TDAG21/default.aspx)

Telecommunication Standardization Advisory Group (TSAG) for the ITU-T Sector. This year, the Telecommunications Standardization Advisory Group took place from the 1-4 May 2017. (Please see http://www.itu.int/en/ITU-T/tsag/2017-2020/Pages/default.aspx)

Radiocommunication Advisory Group (RAG) for the ITU-R. This year, the Radiocommunication Advisory Group took place from the 26-28 April 2017. (Please see http://www.itu.int/en/ITU-R/conferences/rag/Pages/default.aspx)

259. **Study Groups for each sector:**

259.1. Standardization work is carried out by the technical Study Groups (SGs) in which representatives of the ITU-T membership develop Recommendations (standards) for the various fields of international telecommunications.

259.2. 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. ITU-D Study Groups are responsible for developing **Reports**, **Guidelines**,

Best Practices and **Recommendations** based on input received from the membership. Information is gathered through contributions, case studies and surveys and is made available for easy access by the membership using content management and web publication tools. The Study Groups examine specific task-oriented telecommunication/ICT questions of priority to developing countries, to support them in achieving their development goals.

Outputs agreed on in the ITU-D Study Groups, and related reference material, are used as guidance for the implementation of policies, strategies, projects and specific telecommunication/ICT initiatives in membership. These activities also serve to strengthen the **shared knowledge base** of the membership. Sharing of topics of common interest is carried out through face-to-face meetings, multilingual remote participation and online collaborative sites, in an atmosphere that encourages **open debate** and **exchange of information** and for receiving input from experts on the topics under study.

ITU-D Study Group 1 scope focuses on "Enabling environment for the development of telecommunications/ICTs" while the work of ITU–D Study Group 2 relates to "ICT applications, cybersecurity, emergency telecommunications and climate-change adaptation".

The following events were held for Study Group 1 in 2017:

ITU-D Study Group 1 Rapporteur Group meetings
9-18 (am) January 2017, Switzerland [Geneva]

ITU cybersecurity workshop: Cybersecurity and risk assessments in practice
26 January 2017, Switzerland [Geneva]

Fourth meeting of ITU-D Study Group 1 (2014-2017 study period)
27 - 31 March 2017, Switzerland [Geneva]

The following events were held for Study Group 2 in 2017:

ITU-D Study Group 2 Rapporteur Group meetings
18 (pm)-27 January 2017, Switzerland [Geneva]

Fourth meeting of ITU-D Study Group 2 (2014-2017 study period)
3 - 7 April 2017, Switzerland [Geneva]

259.3. The ITU-R Study Groups develop the technical bases for decisions taken at World Radiocommunication Conferences and develop global standards (Recommendations), Reports and Handbooks on radiocommunication matters. More than 4 000 specialists, from administrations, the telecommunications industry as a whole and academic organizations throughout the world, participate in the work of the Study Groups on topics such as efficient management and use of the spectrum/orbit resource, radio systems characteristics and performance, spectrum monitoring and emergency radiocommunications for public protection and disaster relief. (Please see http://www.itu.int/en/ITU-R/study-groups/Pages/default.aspx)

260. **World Telecommunication Development Conferences**

The World Telecommunication Development Conference (WTDC) sets the agenda and guidelines for the ITU-D Sector for the following four-year cycle, while Regional Conferences review "work-in-progress" towards the overall objectives and ensure that goals are met. The Telecommunication Development Conferences serve as forums for the discussion of the digital divide, telecommunications and development by all stakeholders involved in and concerned with ITU-D's work. In addition, they review the numerous programmes and projects of the Sector and Telecommunication Development Bureau (BDT). Results are reported and new projects are launched. Each Regional Preparatory Meeting brings together the countries in its region to explore and discuss their needs and the present and future projects of the Sector.

The *World Telecommunication Development Conference* (*WTDC*) is an international event organized every 4 years by the ITU. The World Telecommunication Development Conference (WTDC-17) convened in **Buenos Aires, Argentina, from 9 to 20 October 2017** following the kind invitation of the Government of Argentina and the approval by the Council with the concurrence of a majority of the Member States of ITU. It was preceded by six regional preparatory meetings, two in the last quarter of 2016 and four in the first quarter of 2017, starting in the Commonwealth of Independent States (CIS), then Africa, Arab States, Americas, Asia-Pacific, and Europe.
World telecommunication development conferences (WTDCs) are convened in the period between two Plenipotentiary Conferences to consider topics, projects and programmes relevant to telecommunication development. WTDCs set the strategies and objectives for the development of telecommunication/ICT, providing future direction and guidance to the ITU Telecommunication Development Sector (ITU-D).

The theme of WTDC-17 was **"ICT for Sustainable Development Goals" - ICT④SDGs.** The draft agenda of WTDC-17, as approved by the ITU Council with the concurrence of a majority of the Member States, is available here.
Outcomes of WTDC-17 include

- a Declaration reinforcing the political support for the mission and strategic objectives of ITU-D;
- an ITU-D Contribution to the ITU Strategic Plan for 2020-2023;

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and an ITU-D Action Plan comprising regional initiatives, new and revised resolutions and recommendations to support the fulfilment of the Sector's objectives, and new and revised Questions to be studied by ITU-D study groups.

For additional information please see:

http://www.itu.int/en/ITU-D/Conferences/WTDC/WTDC17/Pages/default.aspx

Action Line C3: Access to Information and Knowledge, (also related to the 2030 Agenda for Sustainable Development)

Related to SDGs: SDG 1, SDG 2, SDG 3, SDG 4, SDG 5, SDG 6, SDG 7, SDG 8, SDG 9, SDG 10, SDG 11, SDG 12, SDG 13, SDG 14, SDG 15, SDG 16, SDG 17

261. The Action line C3 Access to Information and Knowledge Facilitation Meeting was held on Thursday 15 June 2017, entitled "Is Software the key to Access to knowledge in the Digital age?". The session discussed how software is a key part of the technological and scientific knowledge of humanity that must be preserved and shared, as well as "the ability for all to access and contribute information, ideas and knowledge is essential in an inclusive Information Society. Please read the outcomes here: https://www.itu.int/en/itu-wsis/Documents/wf17/WSISForum2017_ForumTrackOutcomes.pdf

262. In 2016 ITU-D held numerous workshops, conferences and symposiums, making materials widely available for free on the web. In addition, a number of information-rich resources have been made available including web-based information portals, practical ICT toolkits and online databases have been launched and/or existing resources updated.

263. ITU developed a set of "Guidelines for Promoting ICT Accessibility for Persons with Disabilities in the Americas Region". These Guidelines are available in English, Spanish and Portuguese.

264. The joint ITU-G3ict Model ICT Accessibility policy report was launched during the Accessible Americas event November 2014.

265. The "Smart Accessibility on Connected TV" workshop was held in Barcelona on 18 March, 2015 organized by the Autonomous University of Barcelona in partnership with the International Telecommunication Union and European Commission.

266. Concerning broadband Access ITU, with support from Korea, has assisted countries in developing broadband policies and plans. Currently, support has been provided to develop Wireless Broadband Master Plans and National Broadband Plans/Policies to Fiji, Cambodia, Brunei, Vietnam, Samoa, Nepal, Myanmar, Bhutan, Bangladesh, Papua New Guinea, Indonesia, Pakistan, Lao PDR, Vanuatu, Marshall Islands, Philippines and St Lucia, Malawi, Congo Brazzaville, South Sudan and Bissau Guinea.

267. ITU developed and is maintaining a database for following the transition from analogue to digital terrestrial television broadcasting :

http://www.itu.int/en/ITU-D/Spectrum-Broadcasting/Pages/DSO/Default.aspx

268. The **World Radiocommunication Conference 2015 (WRC-15),** was held in Geneva from 2-27 November 2015. It is the job of WRC to review, and, if necessary, revise the Radio Regulations, the international treaty governing the use of the radio-frequency spectrum and the geostationary-satellite and non-geostationary-satellite orbits. Revisions are made on the basis of an agenda determined by the ITU Council, which takes into account recommendations made by previous world Radiocommunication conferences. The Radio Regulations edition following the decisions of the WRC-15 and it's Final Acts came into force on 1 January 2017.

Regulatory publications

During the 2012-2015 time-frame, the preparation of the ITU-R regulatory publications followed the standard pattern, as foreseen in the Operational Plan, including the edition of the Radio Regulations reflecting the changes decided by WRC-12 in all ITU languages; the consolidated version of the Rules of Procedure reflecting the WRC-12 decisions was published with seven updates with the modifications decided by the RRB. The Rules of Procedure and their updates are published in all ITU languages.

Service publications

The Bureau prepares and issues various service publications, as specified in Article 20 of the Radio Regulations (RR).

In view of the importance of the operational information contained in the maritime-related service publications, particularly with regard to safety, administrations are required to communicate the necessary amendments, as stipulated in No. 20.16 of the RR.

Service publications include:

-List of Coast Stations and Special Service Stations (List IV);

-List of Ship Stations and Maritime Mobile Service Identity Assignments (List V);

-List of International Monitoring stations (List VIII)

-Maritime Manual

269. ITU hosted the World Radiocommunication Seminar 2016 (WRS‑16) in Geneva from 12 to 16 December 2016, offering training focusing on the application of the ITU Radio

Regulations and regulatory aspects of the use of the radio-frequency spectrum and satellite orbits. More than 400 participants attended from over 90 countries. ITU organizes world seminars on spectrum management every two years, as well as regional seminars aimed in particular at addressing the needs of developing countries. During WRS-14, the Director of the Radiocommunication Bureau (BR), noted that "Radiocommunication today are undergoing constant changes. These changes occur as a result of technological improvements and changes in practice and they need to be reflected in the international regulations on spectrum. […] They need to be reflected in the World Radiocommunication Conferences, ITU Radiocommunication Sector (ITU–R) Recommendations, best practices on spectrum use, and the software tools used by ITU to process the thousands of notices we receive every week reliably and efficiently".

Action Line C4: Capacity-Building (also related to the 2030 Agenda for Sustainable Development)

Related to SDGs: SDG 1 (1.b), SDG 2, SDG 3 (3.7, 3.b, 3.d), SDG 4 (4.4, 4.7), SDG 5 (5.5, 5.b), SDG 6 (6.a), SDG 12 (12.7, 12.8, 12.a, 12.b), SDG 13 (13.2, 13.3, 13.b) , SDG 14 (14.a), SDG (16.a) , SDG 17 (17.9, 17.18)

270. Within the framework of its mandate as facilitator for Action Line C4, the ITU organized the facilitation meeting of AL C4 on capacity building which took place as an integral part of the WSIS Forum 2017. The meeting was conducted under the theme "Building capacity to leverage e-Agriculture applications". Among the main conclusions reached during the session was that capacity development is required at three dimensions: individual, organizational and enabling environment; and that end users are an important group to consider in capacity building in order for ordinary people to fully leverage the benefits of e-applications . Please read the outcomes here: https://www.itu.int/en/itu-wsis/Documents/wf17/WSISForum2017_ForumTrackOutcomes.pdf

271. The ITU continues to support its **Centres of Excellence (CoEs)**. The CoEs are institutions sharing expertise, resources and capacity-building know-how in telecommunications and ICTs training/education, distributed around the world. Designed to offer training to ICT managers in the public and private spheres through face-to-face or distance learning programmes, the Centres serve as regional focal points for professional development, research, and knowledge sharing, as well as providing specialist training services to external clients. CoE networks have been established in all regions including Africa, the Americas, Arab States, Asia-Pacific, Commonwealth of Independent States (CIS) and Europe. Under the umbrella of the ITU Academy, these regional networks are now being joined together into a single global network sharing training curricula, resources and expertise.

272. Following Resolution 73 of WTDC-2010, calling for a study to review the strategy of the Centres of Excellence, a new strategy has now been put in place, and took effect from January 2015. Under the new strategy, Centres of Excellence are now restricted to a maximum of six per each region. They are aligned to the priority areas for each four year cycle as determined by World Telecommunications Development Conferences, and are appointed for a specific area of competency within a specific cycle.

Following the adoption of the priority areas for the next four years by the World Telecommunication Development Conference (WTDC 2014), an open and transparent application and selection process for new Centres of Excellence for the next four years was undertaken. A total of 32 new Centres were selected for the 2015-2018 cycle, out of a total of 99 applications received and processed. Regional Steering Committee meetings were held in the first quarter of the year, and all the centres are now fully functional. Training activities under the Centres of Excellence have been taking place in all the 6 regions. Areas for which trainings have been conducted are: Policy and Regulation, Broadband Access, Cybersecurity, Spectrum Management, Digital Broadcasting, ICT Applications and Services, Emergency Telecommunications, e-Waste, and Internet Governance

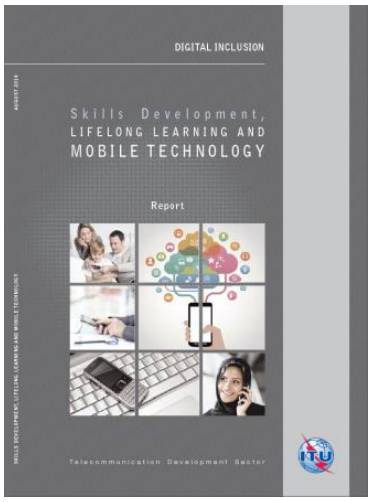
A regional governance structure for t the Centres of Excellence has been put in place in the form of regional Steering Committees which meet once every year to oversee the operations of the Centres of Excellence and provide strategic direction and advice to ITU. The Centres of Excellence have proved to be a key vehicle for training and capacity building for the ITU membership.

273. CoE trainings cover topics such as 4G Mobile Networks, Digital Terrestrial Television, Spectrum Utilization and Harmonization, TV White Spaces, Security Information Systems, Web Security, Satellite Network Registration Procedures and International Relations, IPv6 Infrastructure Security, Spectrum Monitoring, Next Generation Broadband Internet Access, New and Advanced Technologies of Digital Television and Related Video Applications, Optical Networks, Methods of spectrum allocation and assignment, Principles for Radioelectronic and Spectrum Management.

274. As the main ITU umbrella for training activities, the ITU Academy has finalised the development of the ITU **Spectrum Management Training Programme (SMTP).** This program consists of 9 modules at Basic level and six modules at Advanced level, leading to the award of a professional ITU certificate, or even a degree, if taken through University. Agreements have been signed with partners to deliver SMTP and discussions are ongoing with other Universities and training institutions such as Centres of Excellence, interested in delivering this program as part of their curricula. A Quality of Service Training Program (QoSTP) has also been developed and is ready for delivery. Other training programmes are also being developed such as ICT and Climate Change Training Programme, and Internet of Things Training Programme. A Masters in Communications Management degree

programme has also been launched in collaboration with the United Kingdom Telecommunications academy (UKTA).

275. The ITU Academy platform underwent an upgrade which introduced new service offerings and functionalities that will greatly improve the quality of service and experience offered to the ITU members and all other users. The new themes in Moodle and in Joomla are inspired by academic institutions platforms to give the learner a good learning environment experience, There are new and improved features such as online payment using debits and credit cards; online registration; smart search engine; smart content repository; personalized learner access, and improved course design and delivery, among others. Guidelines have been prepared to assist users, - mainly Centres of Excellence- to understand the new platform. A training of ITU staff on the use of the ITU Academy platform was conducted in 2016.



276. Close contact has continued with the BDT on work of mutual interest to ITU-R and ITU-D. The BR has participated in relevant meetings of ITU-D Study Groups, Rapporteur Groups and TDAG, where liaison activities have involved topics such as spectrum management, digital broadcasting and migration from analogue systems, transition towards and implementation of IMT, and broadband wireless access technologies. These topics are in addition to the collaboration undertaken through ITU-D Question 9-3/2 that calls for the identification of study topics in ITU-R (and ITU-T) considered of particular interest to developing countries.

277. In response to requests from the BDT, experts from ITU-R and BR have participated in ITU seminars and workshops organized by ITU-D (see also Section 8.2.4). Within the framework of Resolution ITU-R 11-4 (Further development of the spectrum management system for developing countries), BR has been involved with the design, testing and training associated with the software SMS4DC (Spectrum Management System for Developing Countries), with advice provided on the use of relevant ITU-R Recommendations. In addition, ITU-R Study Group 1 has continued to work closely with the ITU-D Study Groups in pursuing studies on spectrum usage in accordance with Resolution ITU-D 9.

In 2013, the BR developed jointly with the BDT an ITU Report on the Digital Dividend. On this basis, ITU-R Study Group 1 has since developed and recently adopted an ITU-R Report on this subject.

With the needs of developing countries always in mind, the production of Handbooks has continued to be viewed as a major Study Group activity. In this respect, new or revised Handbooks have been developed on topics such as spectrum monitoring, radiowave propagation information for designing terrestrial point-to-point links, amateur and amateur-satellite services, migration to IMT-2000 systems and use of radio spectrum for meteorology – weather, water and climate monitoring and prediction.

Since 2013, the BR actively participated in a joint project with the BDT to develop the Spectrum Management Training Programme (SMTP) through its different phases: design,

material preparation, peer review, pilot test (conducted in 2015 and now under evaluation). In 2016, it is planned to implement the full SMTP programme for training of the staff of a Spectrum Regulatory Authority in a developing country.

278. In addition to climate change and emergency communications, topics of mutual interest between ITU-R and ITU-T include IMT 2020, the effects of human exposure to radio frequencies, power line transmission systems, intelligent transport systems, common patent policy and intellectual property rights and audiovisual media accessibility.

279. SG 6 established a new Intersector Rapporteur Group (IRG) on Integrated Broadband Broadcasting (IBB) systems in addition to the two existing IRGs on audiovisual media accessibility (IRG-AVA) and on audiovisual quality assessments (IRG-AVQA).

280. There continues to be a requirement for close coordination on the various topics being addressed by ITU-T that impinge on radiocommunication issues to reduce the potential for overlap, duplication and conflict of work undertaken by the two Sectors.

281. A publication on Skills Development, Lifelong Learning and Mobile Technology, has been produced and released in 2017. The document is the work of an international team of experts, who have contributed to nine chapters dealing with using mobiles for learning and capacity building.

282. Under a partnership with International Telecommunications Satellite Organisation (ITSO), two training activities on satellite communications were held in Nairobi, Kenya, for English speaking Africa in August 2016 and in Dakar, Senegal for French speaking Africa in. Similar training will be repeated within the region in 2017. Another training was conducted in Oman for the Arab region

283. In September 2016 ITU organised the Global ICT Capacity Building Symposium (CBS), held in Nairobi, Kenya. The Symposium attracted 440 participants from 46 countries and featured two pre-events, one on Internet governance and the other on the role of regulators in capacity building. The issues discussed at the symposium included new skill sets required for the 21st century information age and job markets, ICT skills and capacity building for achievement of SDGs, and the importance of public-private partnerships (industry, government, academia) in capacity building.

284. In May 2017, a training on Quality of Service was delivered for SADC countries, in Gaborone, Botswana. The training attracted 106 participants from 8 countries. Participants provided feedback on the Quality of Service Training Programme and shared information on their countries legal and regulatory frameworks. These country case studies will form part of reference materials for the QoSTP.

285. The ITU regional workshop on "Strengthening capacities in international Internet governance" was held in Brasilia, Brazil, from 14 to 16 August 2017, delivered in partnership with DiploFoundation. The objective of the workshop was to strengthen capacities of the ITU membership in the field of international Internet governance. This workshop was the first in a series of regional Internet governance capacity development events that ITU will organize in collaboration with other stakeholders. The experience from these workshops will feed into the further development of ITU's capacity development and training programmes in the field of Internet governance, which are offered under the umbrella of the ITU Academy.

286. A regional capacity building workshop was held on Child-online safety, for countries of the Common Market for Eastern and Southern Africa (COMESA) in Lilongwe Malawi. The main objective of this workshop provided a platform to African countries to share experiences, strengthen their knowledge and raise awareness on children and youth safe digital inclusion policies and strategies, through a multi-stakeholders approach and interaction.

287. Following a Capacity building Cooperation Agreement signed between ITU and Intel in 2014 during WTDC-14, a virtual Classroom training on Universal Service Policy for Broadband Rollout and Implementation of Smart Learning was run in March for the Arab States. The training covered areas such as Universal Service Policy for Broadband Rollout; Effective use of Universal Service Funds (USF) for broadband projects; and Leveraging ICTs for education in a broadband environment. Programme (STM Programme) is being negotiated for the Americas region. This project is designed to improve the managerial skills and competencies of the professional and executives working in the ICT sector in the Americas Region. The STM Program will comprise of 9 modules to be delivered through a constellation of partner universities within the region.

288. **ITU Regional Radiocommunication Seminars (RRS):** The Radiocommunication Bureau (BR) organizes world seminars on spectrum management every two years in Geneva, as well as regional seminars aiming at the particular needs of developing countries.

The main objectives of BR seminars and workshops are:

- to provide assistance to Member States in spectrum management activities, e.g. through training, information meetings, seminars, development of handbooks and the provision of tools for automated spectrum management; and
- to expand the assistance offered to Member States in coordinating and registering frequency assignments and in applying the Radio Regulations, with special attention to developing countries and Member States that have recently joined the Union.

The following RRS were held in 2015 -2016:

RRS-15-Eastern Europe and CIS, Bishkek, Kyrgyz Republic, 2-6 March 2015

RRS-15-Africa, Niamey, Niger, 20-24 April 2015

RRS-15-Asia-Pacific, Manila, Philippines, 25-30 May 2015

RRS-15-Americas, San Salvador, El Salvador, 27-31 July 2015

RRS-16-Americas, Port of Spain, Trinidad and Tobago, 18-22 July 2016

RRS-16-Asia-Pacific, ITU/PITA Regional Radiocommunication Seminar 2016 for Asia&Pacific, Apia, Samoa, 19-23 September 2016.

289. **Inter-Sectoral cooperation on ITU Workshops**

The period since WRC-12 witnessed a busy schedule of events organized entirely by BR or in cooperation with BDT/TSB and/or other bodies (see http://www.itu.int/ITU-R/go/seminars). A new series of workshops on the efficient use of the orbit and spectrum was organized with a view to openly discussing issues often qualified as "sensitive" and making progress on the exchange of ideas to adapt and improve the international satellite regulatory registration framework at the next WRC.

Within the framework of the ITU Centres of Excellence for Asia-Pacific Region, the Bureau organized the first online training program on "Satellite Network Registration Procedures and International Regulations" for the Asia-Pacific Region jointly with the ITU office in Bangkok (Thailand) and the State Radio Monitoring Centre (SRMC), MIIT, China, from 1st till 28th June 2015. The program focused on Satellite Network Registration Procedures and International Regulations and covered an introduction to satellite projects, the Radiocommunication Sector in the ITU & Orbit-Spectrum Regulations, Non-planned Space Services Procedures, Planned Space Services (BSS & FSS) Procedures and other topics.

The course objectives were to develop a basic knowledge of satellite projects, to understand the international regulations governing satellite network registration, to understand in detail, the coordination procedures concerning satellite registration and share experiences and challenges concerning satellite network registration.

An ITU Symposium and Workshop on small satellite regulation and communication systems was also held in Prague, Czech Republic, 2-4 March 2015. The three-day event focused on the regulatory aspects of the use of the radio-frequency spectrum and satellite orbits for small satellite communication systems, in particular on the application of the provisions of the ITU Radio Regulations. It was organized by the ITU in cooperation with the Czech Technical University's Faculty of Electrical Engineering (CTU FEE), an ITU Academia Member. It was attended by more than 160 participants from around 40 countries.

The participants concluded the Symposium with the unanimous endorsement of the 'Prague Declaration on Small Satellite Regulation and Communication Systems', which urges the small satellite community to comply with the applicable international and national laws, regulations and procedures, indispensable to guarantee the long-term sustainability of small satellite projects, the avoidance of harmful interference and proper management of space debris. The declaration also recommends that ITU continue capacity-building activities on the regulation of satellite communication systems (see http://www.itu.int/en/ITU-R/space/workshops/2015-prague-small-sat/Documents/Prague%20Declaration.pdf).

The Bureau intends to continue its cooperation with the ITU Centres of Excellence for Asia-Pacific Region and to organize, on a regular basis, online courses on satellite network registration procedures. In view of the success of this activity, the Bureau intends also to develop the same online course for Africa and the Americas.

Action Line C7: ICT Applications

Action Line C7: E- Government

Related to the SDGs: SGD 9 (9.c), SDG 16 (16.6, 16.7, 16.10), SDG 17 (17.8)

290. The Action line C7 E Government Facilitation Meeting was held on Thursday 15 June 2017, entitled "Eradicating Poverty and Promoting Prosperity through Digital Government". The participants discussed many issues, such as: the most promising uses of E-Government for improving the lives of the poorest people and for eradicating poverty and main shortcomings and risks; measuring progress in digital government development; partnerships for digital government development, among others. Please read the outcomes here: https://www.itu.int/en/itu-wsis/Documents/wf17/WSISForum2017_ForumTrackOutcomes.pdf

Action Line C7: E-Health

Related to the SDGs: e-health: SDG 1 (1.3, 1.4, 1.5), SDG 2 (2.1,2.2), SDG 3 (3.3, 3.8), SDG 5 (5.6, 5.b), SDG 17 (17.8, 17.19)

291. The Action line C7 E Health Facilitation meeting was held on Thursday 15 June 2017 co-organized by WHO and ITU. The topic of the meeting was "ICT for Universal Health Coverage (UHC)". The session discussed the Universal Health Coverage (UHC), which includes financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all. Please read the outcomes here: https://www.itu.int/en/itu-wsis/Documents/wf17/WSISForum2017_ForumTrackOutcomes.pdf

292. A High-Level joint ITU-World Health Organization (WHO) "Digital Health Policy Dialog" held in Geneva on 23-24 May 2016 which shared experiences and identified strategies among 250 participants, including five ICT and five Health ministers on how policies and cross-sectoral collaboration between the health and ICT sectors could foster innovation to improve the quality, equity and accessibility of health services.

293. Technical Assistance provided to Benin, Mali and Tunisia to develop and validate their national e-Health Strategy.

294. A "Toolkit and Implementation Guidelines for a Digital Health Platform" was developed to guide decision makers and health planners in designing and implementing a national "digital health platform".

295. A joint effort was launched with WHO African Region to scalie up Digital Health services in Africa. The partnership will focus on building a capable workforce to effectively use ICT as well as addressing the need of multi-stakeholders partnership models that can bring about sustainable adoption of Digital Health.

- "Be He@lthy, Be Mobile" is a global joint initiative launched in 2012 between ITU and WHO to use mobile for non-communicable diseases (NCDs). The initiative works with governments to identify and scale up evidence-based interventions to use mHealth to address NCDs and their associated risk factors. It currently provides technical and financial support to programmes in nine countries (Egypt, Tunisia, India, the Philippines, Costa Rica, Norway, the United Kingdom, Zambia and Senegal) across a range of income groups and disease areas, including mSmokingCessation, mDiabetes and mCervicalCancer and mCOPD. It also promotes a highly multisectoral approach to ensure that the programmes are sustainable. This is achieved through encouraging partnership between ministries of health and ministries of ICTs, together with support from other groups such as academia, multilateral agencies and relevant partners from the private sector.
- In the context of this initiative, three different mDiabetes programme were launched in Senegal, India and Egypt in collaboration between the Ministry of Health and the Ministry of ICT to help diabetic patients to safely manage their illness and reduce the number of emergency hospitalizations. Currently 100,000 users are subscribed in India, and 112,000 and 100,000 users are subscribed respectively in Senegal and Egypt, all of whom receive regular messages about diabetes prevention and control.
- Another three mSmokingCessation programmes were launched in India, Tunisia and the Philippines to use mobile applications to assist smokers to quit smoking. Close to 2,000,000 users are subscribed in India, with the launch of the pilot phase already begun for Tunisia and Philippines.
- Guidelines on the use of mobile applications for smoking cessation, diabetes prevention and control and cervical cancer were developed in collaboration with WHO.
- Built the human and institutional capacity of 7 Afghan participants on mobile application development to address the existing gaps and lack of skilled professionals in mobile application development in Islamabad, Pakistan, from 16-26 February 2016.
- A major agreement was signed with the European Commission and WHO to set an mHealth Innovation and Knowledge Hub in Europe. The Hub will be collecting and

disseminating research and experience relating to the large-scale implementation of mHealth programs and support Member States in setting up large-scale mHealth programs.

- A West African Regional Workshop on National eHealth Strategy Implementation held on 26-27 April 2016 in Abuja, Nigeria, which supported 50 participants from ministries of Health and ICT from 15 countries in the West African region to develop and/or to implement their national eHealth strategies. A regional workshop on National eHealth Strategy development organized in Cotonou, Benin on 24-26 November 2015, which built the capacity of 30 delegates from ministries of Health and ICT in 6 Francophone countries to develop national eHealth Strategies.
- Assistance was provided to Zimbabwe through an infrastructure and equipment audit to extend telemedicine services in remote areas of the country, as well as in-country training.

2014-2015 Outcomes

- An e-Health workshop was organized in Harare, Zimbabwe, aiming at using ICT to support healthcare for children and women in the framework of ITU/WHO partnership through the COIA (Commission of Information and Accountability).
- The WHO-ITU have initiated a project (2017-2021) to establish an mHealth Knowledge and Innovation Hub through financial support the European Commission (EC) Horizon2020 Programme. This will enable both the development of national mHealth interventions in selected EU member states to champion the uptake of mHealth and the foundation and maintenance of a centralised 'Knowledge and Innovations Hub for mHealth' to monitor and enable mHealth adoption and innovation.
- Facilitated experience exchange on the issues of telemedicine and enhanced cooperation within the region at ITU regional workshop, which was held in Tashkent, Uzbekistan from 7 to 9 October 2015 and attracted 35 participants from 6 countries.
- Carried out an assessment on the 'Potential Use of Mobile Applications in Health Sector of Bangladesh (2014) and carried out survey on Cybersecurity Readiness for a number of countries in Asia-Pacific (2015).
- Two study group meetings for the ITU-D Question 2/2 on "e-Health" were held in 2016.
- ITU-T SG16 developed updates to the personal connected health specifications in the **ITU-T H.810-H.850 series of Recommendations**, where two new and 37 revised conformance testing specifications were approved for the third edition of the Continua Design Guidelines (CGD) in the ITU-T H.810 series. With this updates, developers will be able to check compliance of their implementations of H.810 devices and systems to the latest version of the CDG.
- A revision was completed of the Technical Paper HSTP.H810-XCHF that explains fundamentals of data exchange within ITU-T H.810 Continua Design Guideline architecture. The revised paper is now aligned with the 3rd edition of ITU-T H.810.

Action Line C7: E –Agriculture

Related to the SDGs: e-agriculture: SDG 1 (1.5) , SDG 2 (2.3,2.4,2.a) , SDG 3(3.d), SDG 4, SDG 5 (5.5), SDG 8 (8.2) , SDG 9 (9.1, 9.c) , SDG 12 (12.8), SDG 13 (13.1, 13.3), SDG 17 (17.16,

296. The Action line C7 E-Agriculture Facilitation meeting was held jointly with the Action line C7 E Agriculture Facilitation Meeting Thursday 15 June 2017, entitled "Democratizing Digital Innovation in Agriculture". The session exposed how innovative ways to use ICTs in the rural domain, with a primary focus on agriculture (including farming, fisheries, livestock, forestry, etc.), can boost agricultural and rural development, as improving access to valuable information help agricultural stakeholders to make informed decisions and use the resources available in the most productive and sustainable manner. Please read the outcomes here: https://www.itu.int/en/itu-wsis/Documents/wf17/WSISForum2017_ForumTrackOutcomes.pdf

- A joint ITU-FAO e-Agriculture Strategy Guide was published to provide countries with a framework to develop their national e-agriculture strategies. E-agriculture strategies will help to rationalize both financial and human resources, and address ICT opportunities for the agricultural sector in a more holistic and efficient manner.
- Two Regional workshops were co-organized with FAO in Bangkok (Thailand) on 9-11 February 2015 and Budapest (Hungary) on 22-24 June 2015 which supported 80 delegates from ministries of agriculture in 15 countries to develop e-Agriculture strategies.
- The Joint ITU-FAO e-Agriculture Solutions Forum, held in Bangkok on 29 August - 31 September 2016 shared e-Agriculture solutions amongst more than 120 participants from 29 countries that benefited agriculture stakeholders and established an Experts Group among e-Agriculture solution providers. In addition, the capacity was built on developing e-Agriculture strategies in a training held following the Forum on 1-2 September 2016.
- A Cooperation Agreement with FAO was prepared to reinforce the working relationship on e-Agriculture issues and expand the scope and depth of activities.
- An ITU-Telecom Regulatory Authority of India (TRAI) training on "Leveraging ICTs for Smart Sustainable Cities" in addition to a national symposium on "ICT Regulatory challenges in Indian Smart Cities" held on 24-26 March 2015 raised awareness among more than 190 participants on the latest trends in smart city developments.
- Raised awareness by featuring more than 25 ICT applications that are relevant for the Sustainable Development Goals (SDGs) in the BDT thematic pavilion at ITU Telecom in Budapest, under the theme of "Smart ICTs for Sustainable Development" on 12-15 October 2015.
- Raised awareness of stakeholders in the region on how to implement and develop the most popular mobile applications during the ITU regional workshop held on Issyk Kul Lake, Kyrgyz Republic from 6 to 8 September 2016.

– In partnership with FAO, Technical Assistance was provided towards development of the e-Agriculture Strategy for Sri Lanka, Fiji, Philippines and Papua New Guinea and the national E-Renewable Natural Resources Master Plan for Bhutan.

–A new standard on ICT and adaptation of agriculture to the effects of climate change provides a description of how the use of ICT can help sustain the agricultural sector in the event of poor yields or disasters triggered by climate change.

–ITU-T Study Group 5 is working on a draft Recommendation on "Use of ICT in the adaptation of the Fisheries Sector to the Effects of Climate Change". This Recommendation will aim at highlighting the use of ICT in the fisheries sector to better adapt to the effects of climate change.

–ITU-T SG13 has approved a Recommendation on smart farming framework and work is in progress on a service model for the pre-production stage for smart farming.

–ITU-T Study Group 20 within Q4/20 on "e/Smart services, applications and supporting platforms" is working on a draft Recommendation on "Framework of IoT-based Smart Greenhouse". IoT-based Smart Greenhouse (herein after ISG) is an IoT-based approach toward food production. The goal of ISG is to provide and maintain optimal conditions for growing crops in greenhouse environment; the optimal growth conditions can be automatically adjusted with help of a number of sensors and actuators.

Action Line C7: E – Environment

Related to SDGs: SGD 9 (9.4), SDG 11 (11.6, 11.b), SDG 13 (13.1, 13.3, 13.b), SDG 14, SDG 15

297. The Action line C7 E Environment Facilitation meeting was held Monday, 12 June 2017 as an integral component of the WSIS Forum 2017. It was co-organized by WMO, UNEP-Basel Secretariat and ITU. The topic of the meeting was "Environment, an Important Pillar to Building a Sustainable Future". This session discussed the importance of WMO's Global Framework for Climate Services (GFCS), as well as the critical role ICTs play for Climate Service Information System, Early Warning Systems in dealing with Disaster Risk Reduction, and the role ICTs play to empower nations to attain Sustainable Development Goals; in particular SDG6 on Water, SDG12 on responsible production and consumption, SDG13 on Climate Change, SDG14 on Ocean and SDG15 on biodiversity from data collection to information sharing. Please read the outcome of the meeting here: https://www.itu.int/en/itu-wsis/Documents/wf17/WSISForum2017_ForumTrackOutcomes.pdf

298. The Development sector of the ITU has undertaken several activities falling under the action line c7 e- environment, in particular Emergency Telecommunications, E-waste, Climate change, Disaster risk management and so on:

296.1 Emergency Telecommunications:

- BDT deployed emergency telecommunications equipment to the following countries: Haiti and Zimbabwe. The equipment included satellite mobile phones, broadband global area network (BGAN) terminals, laptops, and solar panels for charging the equipment. Training on the use of the equipment was also provided to staff designated by the respective governments.
- Early warning systems (EWS): Final implementation of the EWS for Zambia
- Movable and Deployable Units Project is ongoing.
- A new Cooperation Agreement was signed between ITU and Ultisat pertaining the donation of Two (2) complete fixed VSAT systems including free satellite connectivity for 6 months after installation as well as end-to-end managed services.
- Ongoing implementation of the ITU Big Data Project for mitigating epidemics. This project involves three countries, Sierra Leone, Guinea and Liberia.
- Development of the Second Multi-stakeholder Forum on the Role of Telecommunication/ICTs for Disaster Management for the Americas Region, that took place in Bogotá, Colombia from 29 to 31 August 2017. This event builds on the first Forum that took place in Bogotá, Colombia in July 2012. The 2017 event was attended by over 300 participants from different countries in the Region as well as different UN organizations,

private sector entities, NGO's, academia and other humanitarian organizations.

- Development of the ITU-GSMA Regional Training Workshop on ICTs for Disasters Management for Arab States; Khartoum, Sudan 28-29 August 2017.

296.2 E-waste:

- The e-waste management policy and regulatory framework for Saint Lucia was finalized.
- A handbook on e-waste policies and legislative frameworks for ICT generated e-waste is being developed, and will be published in Q1 of 2018.
- The publication on best practices on e-waste management, which identifies successful models of e-waste management centers, is under preparation.
- During the WSIS Forum 2017, BDT organized a session on 'Addressing the Global e-waste Challenge', to highlight current challenges in the area of e-waste, discuss measurement issues and to introduce the Global E-waste Statistics Partnership.
- In 2017, ITU, in cooperation with the United Nations University (UNU) and the Solid Waste Association (ISWA), launched the Global E-waste Statistics Partnership. Its main objectives are to improve and collect worldwide e-waste statistics, and to publish these in the 2017 global e-waste monitor. The Partnership will also raise visibility on the importance of tracking e-waste, and deliver capacity building workshops.

296.3 Climate Change:

- Within the ITU Academy, BDT is finalizing standardized training materials for a full training program on ICTs and Climate Change. Capacity Building efforts will be based on this material. Contributions by relevant experts in ITU-T have enriched the preparation of these modules. A number of academic institutions are also contributed and supported the editing of materials developed. ITU Centres of Excellence and other partners will also benefit from these materials.
- gathering and reporting much needed for both climate change adaptation and mitigation.
- BDT participated and contributed to the organization of the International Conference on Early Warning Systems that was held in Cancun, Mexico, in May 2017. The following organizations were also part of organizers of : WMO, UNISDR, UNICEF, UNOCHA, among others.

299. The Standardization sector of the ITU has undertaken several activities falling under the action line c7 e- environment, in particular Smart Sustainable Cities and Climate Change, Internet of Things, Energy Efficiency and E-waste, E-waste and EMF, and have

developed important standards and recommendations in the area, please see the activities in detail below,

Smart Sustainable Cities and Climate Change (Past Events)

- The **7th ITU Green Standards Week (GSW-17)** was held from 3 to 5 April 2017 in Manizales, Colombia. It counted with more than 950 participants from 27 countries. The GSW-17 was dedicated to the theme of "Circular Economy and Smart Sustainable Cities" and concluded with the adoption of the Manizales Manifesto (also available in Spanish). The Manizales Manifesto provides a comprehensive overview of the key areas to be explored by cities to transition into a smart and sustainable city, in line with the targets of the Sustainable Development Goals, the New Urban Agenda, the Paris Agreement and the Connect 2020 Agenda.

  GSW-17 was hosted by the Municipality of Manizales and was organized by ITU, in partnership with the University of Manizales, the Economic Commission for Latin American and the Caribbean (ECLAC), the United Nations Industrial Development Organization (UNIDO), the United Nations Environment Programme (UNEP), the Basel Convention Regional Centre for the South American Region (CRBAS), the United Nations Economic Commission for Europe (UNECE), the Telecommunications Regional Technical Commission (COMTELCA), the Inter-American Telecommunication Commission (CITEL), the Development Bank of Latin America (CAF) and the Inter-American Association of Telecommunication Enterprises (ASIET).

  During this event, five Latin-American cities namely, Villarino (Buenos Aires, Argentina) under the category of Digital Literacy, Tres de Febrero (Argentina) under the category of Digital Economy, Vitacura (Santiago de Chile, Chile) under the category of Citizen Security, Bogotá (Colombia) under the category of Citizen Participation and Open Government, and Xalapa (Mexico) under the category of Citizen Security were recognized and awarded for their innovative and successful smart city initiatives and ventures.

  Five Latin-American cities that have achieved outstanding success in their smart-city projects were recognized at GSW-17 with La Asociación Interamericana de Empresas de Telecomunicaciones (ASIET) Digital Cities 2017 awards: Villorino and Tres de Febrero (Argentina), the Vitacura area of Santiago (Chile), Bogotá (Colombia), and Xalapa (Mexico).

  The Manizales Manifesto represents support for ICTs to play a definitive role in the pursuit of social, economic and environmental sustainability, highlighting a series of actions in service of this aim.

- **International IoT Week** in Geneva, 6-9 June 2017, brought together thought leaders from government, international organisations, industry and academia to interrogate the challenges and opportunities emerging with the rise of IoT. Over 200 sessions and activities assessed the latest developments in IoT. Other key topics addressed by International IoT Week included IoT and Big Data, IoT in developing countries, e-health, smart transportation, clean energy, wearable technologies and smart agriculture. The International IoT Week was be co-located with the Global

IoT Summit, an event exploring scientific publications on IoT research. Active participation as a moderator and speaker from international organizations such as United Nations Development Programme (UNDP), United Nations Economic Commission for Europe (UNECE), United Nations Industrial Development Organization (UNIDO), United Nations Office on Drugs and Crime (UNODC), International Telecommunication Union (ITU), World Health Organization (WHO), World Meteorological Organization (WMO), World Trade Organization (WTO), and European Commission (EC) has provided a unique opportunity for various stakeholders to discuss how IoT technology can contribute to achieving the SDGs. The IoT Week 2017 concluded with the adoption of the Internet of Things Declaration to Achieve the Sustainable Development Goals on 9 June 2017 by all the participants. This Declaration encapsulates the core activities to be implemented for the use of IoT as a key enabler to attain the targets stipulated in the SDGs. The Declaration also provides a mapping of these core activities vis-à-vis the SDGs that it will assist in addressing.

- An ITU Forum on Data Management: Transforming Data into Value - Expanding the IoT Potential with a special focus on smart cities took place on 12 March 2017 in Dubai, United Arab Emirates.
- In December 2016, ITU published the case study "Implementing ITU-T International Standards to Shape Smart Sustainable Cities: The Case of Dubai". This case study details Dubai's ambitious and trailblazing journey towards becoming a smart city, a venture worthy of emulation by other aspiring smart cities around the world.
- A Global Portal on IoT, Smart Cities & Communities has been created and provides references to external resources on these issues.
- Study Group 20 in March 2017 created a new **Focus Group on Data Processing and Management to support IoT and Smart Cities & Communities** which will research data processing and management in the context of smart cities. The Focus Group will review existing technical platforms and related guidelines for data processing and management, with a view to identifying standardization demands to be addressed by ITU-T SG20. A key priority of the Focus Group will be to propose mechanisms supporting the interoperability of datasets and data-management systems.

International Standards

- ITU-T Study Group 5 on Environment, Climate Change and Circular Economy is responsible for studying ICT environmental aspects of electromagnetic phenomena and climate change. SG5 also studies issues related to resistibility, human exposure to electromagnetic fields, circular economy, energy efficiency and climate change adaptation and mitigation .Under its environmental mandate SG5 is also responsible for studying design methodologies to reduce ICTs and e-waste's adverse environmental effects, for example, through recycling of ICT facilities and equipment. ITU-T SG5 is the lead study group on electromagnetic compatibility, lightning protection and electromagnetic effects; ICTs related to the environment, climate change, energy efficiency and clean energy and circular economy, including e waste.

- Taking into consideration the development of 5G systems, ITU-T SG5 is developing a series of technical reports and international standards that will study the following environmental aspects of 5G: electromagnetic compatibility (EMC); electromagnetic fields (EMF); energy feeding and efficiency; and resistibility. A Technical Report on "Study on methods and metrics to evaluate energy efficiency for future 5G systems" was published in June 2017. This Technical Paper analyses the energy efficiency issues for future 5G systems. The focus of this Technical Paper is on methods and metrics to measure energy efficiency in 5G systems, with consideration of the degree of stability of the systems known so far and the experience of the legacy systems as well as related measurement procedures for evaluating future standardization evolutions.
- ITU's 'green ICT' standards are contributing to the reduction of the ICT sector's environmental footprint as well as those of other industry sectors. A number of new green ICT standards in the ITU-T L.1000, 1100, 1200 and 1300 series of Recommendations enable energy efficient ICT/telecommunication solutions. For example, **Recommendation ITU-T 1002 on "External universal power adapter solutions for portable information and communication technology devices"** defines the requirements, and provides guidelines on the environmental aspects, of universal power adapter solutions (UPA) designed for use with portable information and communication technology (ICT) devices. It is complementary to Recommendations ITU-T L.1000 and ITU-T L.1001 and aims to cover the widest possible range of ICT devices for portable use within identified voltage and power ranges.
- ITU-T Study Group 5 on Environment and Climate is responsible for studies on methodologies for evaluating ICT effects on climate change and publishing guidelines for using ICTs in an eco-friendly way. Under its environmental mandate SG5 is also responsible for studying design methodologies to reduce ICTs and e-waste's adverse environmental effects, for example, through recycling of ICT facilities and equipment.
- ITU-T SG5 is developing a series of technical reports and international standards that will study the following environmental aspects of 5G: electromagnetic compatibility (EMC); electromagnetic fields (EMF); energy feeding and efficiency; and resistibility.
- ITU's 'green ICT' standards are contributing to the reduction of the ICT sector's environmental footprint as well as those of other industry sectors. A number of new green ICT standards in the ITU-T L.1300 series of Recommendations enable energy efficient ICT/telecommunication solutions. For example, a new environmentally friendly standard for external universal power adapter solutions for laptops and other portable devices provides for improved energy efficiency and reduced greenhouse gas emissions and is expected to lead to significant reductions in e-waste, and thereby will contribute to the achievement of the targets set out by Goal 12 of the UN Sustainable Development Goals to ensure sustainable production and consumption patterns; and will assist in meeting the e-waste target of the Connect 2020 Agenda to reduce the volume of redundant e-waste by 50 per cent by 2020.
- ITU standards to assist in the responsible management of electromagnetic fields include measuring techniques, procedures and numerical models for evaluating the

electromagnetic fields stemming from telecommunication systems and radio terminals. Several new and revised standards in the ITU-T K-series of Recommendations provide EMC resistibility and safety limits of ICT equipment and infrastructure, and thereby contribute to the SDG goal 9.

- **Recommendation ITU-T F.747.9 "Requirements and architecture for energy management services"** describes requirements, scenarios and functional architecture for user-side energy Management Service (EMS) where energy consumption equipment with heterogeneous metering and control capacities coexist, and helps making energy-saving decisions based on multiple factors, such as the demands and optimization policies from the users, the pricing strategies from the suppliers, government subsidies, device status et al.
- **Recommendation ITU-T L.1331 "Assessment of mobile network energy efficiency"** aims to provide a better understanding of the energy efficiency of mobile networks. The focus is on the metrics and methods of assessing energy efficiency in operational networks. This Recommendation explains how to extrapolate the measurements made on partial networks to the level of the total network. Such a simplified approach is proposed as an approximate way of making energy efficiency evaluations at the level of network elements and cannot therefore be considered sufficient for the whole network operation including, for example, transport.
- **Recommendation ITU-T L.1006 "Test suites for assessment of the External universal power adapter solutions for stationary information and communication technology devices"** describes the general test suites applicable to the universal power adapter solution (UPA) designed for ICT devices for stationary (non-portable) use defined in ITU-T L.1001.
- **Recommendation ITU-T L.1007 "Test suites for assessment of the External universal power adapter solutions for portable information and communication technology devices"** considers the creation of specific test suites to assess certain functional aspects of the: energy efficiency, interworking, safety and electromagnetic compatibility (EMC) of universal power adapter solution (UPA) designed for ICT devices for portable use.
- **Recommendation ITU-T L.1205 "Interfacing of renewable energy or distributed power sources to up to 400 VDC power feeding systems"** defines the coupling of local or remote renewable energy into an up to 400 VDC power system without reducing DC performances defined in ITU-T L.1202 mainly for efficiency and reliability. The main advantages are saving of fossil fuel (as a source of primary energy consumption), reduction of GHG emission and increase of resilience.
- Revised **Recommendation ITU-T L.1310 "Energy efficiency metrics and measurement methods for telecommunication equipment"** contains the definition of energy efficiency metrics test procedures, methodologies and measurement profiles required to assess the energy efficiency of telecommunication equipment. Energy efficiency metrics and measurement methods are defined for telecommunication network equipment and small networking equipment. These metrics allow for the comparison of equipment within the same class, e.g., equipment using the same technologies.

- **Recommendation ITU-T L.1315 "Standardization terms and trends in energy efficiency"** contains high level definition of energy efficiency, energy management requirement to increase the energy efficiency of ICT goods/networks/services.
- **Recommendation ITU-T L.1325 "Green ICT solutions for telecom network facilities"** specifies Green ICT solutions for telecom network facilities allowing to introduce highly-efficient infrastructure solutions, including highly-efficient power solutions, renewable energy solutions, air-conditioning energy saving solutions and free and economized cooling solutions.
- **Recommendation ITU-T L.1331 "Assessment of mobile network energy efficiency"** provide a better understanding of the energy efficiency of mobile networks. The focus is on the metrics and methods of assessing energy efficiency in operational networks and explains how to extrapolate the measurements made on partial networks to the level of the total network.
- **Recommendation ITU-T L.1350 "Energy efficiency metric of base station site"** contains basic definitions of energy efficiency metrics, to evaluate the energy efficiency of a base station site including the energy consumption for all the telecom equipment inside the base station site, the entire infrastructure, and energy losses due to AC/DC rectifiers, generator and cable losses.
- **Recommendation ITU-T L.1360 "Energy control of SDN architecture"** defines the integration of Green Abstraction Layer into a Software-Defined Networking architecture ITU-T Y.3302 in which the connections between a set of network resources are on demand and are managed by one or more Software-Defined Networking controllers.
- Three new standards define requirements for lightning protection of fibre to the distribution point equipment, and of earthing for radio base stations and of miniature base stations. A new standard defines the EMC requirements for electrical equipment in telecommunication facilities and describes the requirements for radiated and conducted emissions from electrical systems installed in telecommunication facilities.
- Several revised standards cater for resistibility of telecommunication equipment against overvoltages and overcurrents, and provide safety limits for electromagnetic radiation for devices and to protect human beings.
- **Recommendation ITU-T K.117 "Primary protector parameters for the surge protection of equipment Ethernet ports"** specifies the common-mode, common mode to differential mode conversion and differential mode surge parameter and test circuit requirements of an Ethernet port primary protector.
- **Recommendation ITU-T K.118 "Requirements for Lightning Protection of Fibre To The distribution point (FTTdp) Equipment"** contains the necessary information to enable the protection of a Distribution Point (DP) node in the access network and the associated equipment in the customers' premises. It includes information on the resistibility requirements of the equipment, the rating of the lightning protection, when the installation of protection is necessary and on how to install this protection.

- **Recommendation ITU-T K.119 "Conformance Assessment of Radio Base Stations Regarding Lightning Protection and Earthing"** provides the technical requirements and measurement methods to assess the validity and reliability of the lightning protection and earthing system of radio base stations (RBSs). It focuses on the quality control in the process of construction, acceptance, inspection and maintenance.
- **Recommendation ITU-T K.120 "Lightning Protection and Earthing of Miniature Base Station"** provides guidelines for lightning protection and earthing of miniature base station against lightning surge, especially for those of unexposed environments (to lightning) and unconventional telecommunication sites.
- **Recommendation ITU-T K.121 "Guidance on the Environmental Management for Compliance with Radio Frequency EMF Limits for Radiocommunication Base Stations"** gives guidance on how to manage the compliance with RF-EMF limits in areas near to radiocommunication installations and how to establish processes for responding to public concern about exposure to RF-EMF.
- **Recommendation ITU-T K.122 "Exposure levels in the close proximity of the radiocommunication antennas"** gives information concerning the electric field strength levels that can be expected in close proximity to the broadcasting and radiocommunication antennas so that a comparison with the exposure limits is possible.
- **Recommendation ITU-T K.123 "EMC requirements for electrical equipment in telecommunication facilities"** describes the requirements for radiated and conducted emissions from electrical systems installed in telecommunication facilities.
- **Recommendation ITU-T K.124 "Overview of particle radiation effects on telecommunications systems"** provides basic guidance on soft errors that are caused by particle radiation and that affect telecommunication systems, and details the phenomena of soft errors that arise from particle radiation.
- **Recommendation ITU-T K.125 "Dangerous effects and protective measures against electromagnetic disturbances when internet data centre is co-sited with high-voltage substation"** specifies the calculating methods for dangerous effects, tolerable limits of dangerous effects, tolerable limits of electromagnetic effects from high-voltage substation, distance requirement and protection methods, protective measures, as well as requirements of power frequency magnetic field immunity of server when an internet data centre is co-sited with a high-voltage substation.
- **Recommendation ITU-T K.126 "Surge protective component application guide – High frequency signal isolation transformers"** discusses isolation transformer parameters and how they influence the equipment common-mode and differential-mode surge performance.

  Recommendation ITU-T K.127 "Immunity requirements for telecommunication equipment in close proximity use of wireless devices" specifies the immunity requirements for equipment used in the telecom facilities where wireless LAN devices are used in close proximity. This Recommendation is established in order

to avoid malfunctions of the equipment from RF signals of devices. And this Recommendation contains requirements including test levels, test signal, test procedures and test facilities.

- The following new environmentally friendly standard on E-waste has been approved by SG5: **Recommendation ITU-T L.1002 "External universal power adapter solutions for portable ICT devices"** for a universal charger for laptops and other portable devices. The new standard provides for improved energy efficiency and reduced greenhouse gas emissions and is expected to lead to significant reductions in e-waste.
  One million tons of external power supplies are manufactured each year. ITU-T L.1002 specifies principles for the eco-design of laptop chargers to reduce no-load power consumption five times lower than the norm. When multiplied by the millions of such chargers in use this will greatly reduce the greenhouse gas emissions produced by these devices; usage of the ITU-T L.1000 series of standards will contribute to the achievement of the targets set out by Goal 12 of the UN Sustainable Development Goals to ensure sustainable production and consumption patterns; and will assist in meeting the e-waste target of the Connect 2020 Agenda to reduce the volume of redundant e-waste by 50 per cent by 2020. The applicability of the charger to multiple devices, as well as design principles for the efficient use of raw materials, will greatly increase their lifetime and reduce the e-waste resulting from their disposal. ITU-T Study Group5 developed Recommendation ITU-T L.1002 in the context of WTSA Resolution 79 to pursue international standards, methodologies and other publications relevant to the reduction and responsible management of e-waste.

  ITU-T SG5 also agreed on **Supplement L.Suppl.27 on "Success stories on e-waste management"**. This Supplement sheds light on e-waste management success stories in different countries. The Supplement covers different policies, legislation, initiatives, and different stakeholders' involvement (government, private sector, non-governmental organisations (NGOs), and informal sector). **Supplement L.Suppl.28 on "Circular economy in information and communication technology; definition of approaches, concepts and metrics".** This Supplement introduces Circular Economy (CE) and Resource Efficiency (RE), describes CE as used in the ICT industry, describes existing CE and RE metrics and examples of their use and proposes next steps in CE and RE standardisation.

- ITU-T Study Group 20 on Internet of Things (IoT) and smart cities and communities (SC&C) is responsible for studies relating to Internet of things (IoT) and its applications, and smart cities and communities (SC&C). This includes studies relating to big data aspects of IoT and SC&C, e-services and smart services for SC&C. ITU-T SG20 is the lead study group on Internet of things (IoT) and its applications, smart cities and communities, including its e-services and smart services and for Internet of things identification.

  ITU standards supporting the wide range of technologies under the banner of the Internet of Things will assist both developed and developing countries in transforming city infrastructure, benefiting from the efficiencies of intelligent buildings and transportation systems; smart energy and water networks; and

innovation in the field of e-health. The IoT and Smart Cities and Communities Standards Roadmap is being maintained by JCA-IoT and SC&C.

- ITU technical work to **combat ICT counterfeiting** continues to gain momentum with new standards under development, supported by ongoing studies into the scale and dynamics of the counterfeiting challenge. ITU-T SG11 developed plans for implementation of WTSA-16 Resolution 96 "ITU Telecommunication Standardization Sector studies for combating counterfeit telecommunication/ information and communication technology devices" and Resolution 97 "Combating mobile telecommunication device theft" where new work was started to develop a framework for combating the use of stolen mobile ICT devices, and supporting information on a framework for solution to combat counterfeit ICT devices; along with guidelines on best practice and solutions.

  As a result of a previous ITU-T SG11 meeting, TSB in collaboration with BDT conducted a study in Africa where it was recognized that counterfeit and substandard ICT devices pose a lot of challenges in developing countries, particularly the Africa region. The survey report on counterfeit ICT devices in Africa region was approved by ITU-T SG11 in February 2017.

  The ITU-T SG11 regional workshop for Africa on "Counterfeit ICT Devices, Conformance and Interoperability Testing Challenges in Africa" took place in Cairo (Egypt) on 5 April 2017. The event gave an overview of the current situation on combating counterfeiting, new trends and mechanisms in ICT counterfeiting, tampering and/or duplication of unique device identifiers and the implementation of C&I regimes in the region. The outcomes of the workshop identifies the key priorities for African countries in standardization of issues highlighted during the event.

Working Together with the UN System

- E-waste:
  - TSB represents ITU in the Step Initiative and participate in its meetings. TSB has been actively contributing to the Step publications and project plans.
  - TSB represents ITU in the PACE Initiative and participate in its meetings and contributes to its publications.
  - TSB represents ITU in Global Partnership on Waste Management (GPWM) and chairs the working on e-waste.
- Smart Sustainable Cities:
  - ITU and UNECE provide Secretariat support to the U4SSC initiative which is supported by 14 other UN Agencies and Programmes (please see above for more information).

Action Line C7: E-Science, (also related to the 2030 Agenda for Sustainable Development)

Related to the SDGs: SDG 1 (1.5) , SDG 4 (4.7) , SDG 6 (6.1, 6.a) , SDG 7 (7.a), SDG 13 (13.1, 13.2, 13.3), SDG 14 (14.a), SDG 15 (15.9) , SDG 17 (17.6, 17.7)

300. The Action line C7 E Science Facilitation meeting was held Thursday 15 June 2017as an integral component of the WSIS Forum 2017. The topic of the meeting was "Context of Big Data and Analytics for Knowledge Societies". This session discussed how systematic organization and retrieval of data is a challenging task as the process that involves annotations, descriptions and methods of semantic indexing, since data by itself maybe a string of characters, signals and symbols and may not in its form be amenable to semantic driven applications for organization and retrieval. Please read the outcome of the meeting here: https://www.itu.int/en/itu-wsis/Documents/wf17/WSISForum2017_ForumTrackOutcomes.pdf

301. ITU is one of the co-facilitators together with UNESCO, UNDESA and Regional Commissions, ILO, ITC, FAO, UPU, UNEP, WMO, UNCTAD, WHO, etc. for the eight areas of ICT applications that are covered by WSIS Action Line C7. ITU is running the ITU Academy for trainings on ICT related issues. (https://academy.itu.int/).

302. Training on Spectrum management (Spectrum Management Training Programme) has been finalized and the first pilot training was delivered https://academy.itu.int/index.php?option=com_content&view=article&id=102&Itemid=641&lang=en

303. Cooperation agreements were signed with the University of Prague and AFRALTI (Kenya) for delivering part or the whole training programme.

304. Quality of Service Training Programme (QoSTP) is under development (https://academy.itu.int/news/item/1555/)

Action Line C7: E-Learning (also related to the 2030 Agenda for Sustainable Development)

Related to the SDGs: SDG 4

305. The Action line C7 E Learning Facilitation meeting was held on Thursday, 15 June 2017as an integral component of the WSIS Forum 2017. The topic of the meeting was "Open Educational Resources to achieve Quality Education for all (SDG4)". This session explored actions related to supporting SDG 4 'Education' of the Education 2030 agenda, emphasizing on the 5 challenges to mainstreaming OER, as identified in the lead up to the 2nd World OER Congress. 1) the capacity of users to access, re-use and share OER; 2) issues relating to language and culture; 3) ensuring inclusive and equitable access to quality OER; 4) changing business models; and 5) the development of supportive policy environments. Please read the outcome of the meeting here: https://www.itu.int/en/itu-wsis/Documents/wf17/WSISForum2017_ForumTrackOutcomes.pdf

306. As the lead agent for all ITU capacity building activities, the ITU Academy continues to produce publications as part of its main deliverables. A mobile publication "Skills Development, Lifelong Learning and Mobile Technology" is due for release soon. This publication explores in-depth the full potential of mobiles for learning outside the formal educational system and structures. The publication has 9 chapters, written by a global team of diverse experts, academics and practitioners, carefully chosen for their acknowledged expertise in particular areas related to mobiles and learning. While discussing the capabilities of mobile devices and opportunities they present in improving access to learning, the 9 chapters of this publication cover among other topics, education aspects of mobile impact, uptake and usage; the basic platform, exploring the growing capabilities and extensibility of mobile devices through applications; as well as challenges and policy options. The summary of the publication will be made available on the ITU Academy website for download, and the chapter conclusions of this publication are prepared for presentation in regional forums and workshops to facilitate discussions in the area of mobile learning.

307. The ITU Academy platform has just undergone an upgrade in 2015. This platform allows for single visibility of all ITU training related activities and delivery of online learning. The new themes in the learner management system (Moodle) and in the content management system (Joomla) are inspired by academic institutions platforms to give the learner a good learning environment experience, There are new and improved features such as online payment using debits and credit cards; online registration; smart search engine; smart content repository; personalized learner access, and improved course design and delivery, among others. Guidelines have been prepared to assist users, -mainly Centres of Excellence- to understand the new platform. A training of ITU staff from all the bureaus on the use of the ITU Academy platform will take place in 2016. Sixteen staff members have enrolled for the training.

308. capacity of 250 participants including 4 ministers and 2 vice-ministers of ICTs and 2 ministers and 3 vice-ministers of education on how new, more affordable digital devices can help address urgent educational challenges and meet the needs of students, teachers and administrators. Another Joint UNESCO-ITU "Policy Forum on Mobile Learning" was

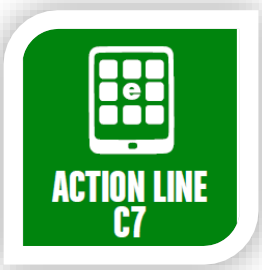
held on 24 March 2017 attracting over 300 participants and stressed on the importance of cross-sectoral collaborations in developing the necessary E-skills.

309. A joint ITU-UNESCO Policy Note on Mobile Learning was published in 3 languages (English, French and Spanish) which made policy recommendations on the way forward. The Policy Note is available at: http://www.itu.int/en/ITU-D/Initiatives/m-Powering/Pages/ITU_UNESCO_MLW_PolicyForum.aspx

- A joint UNESCO-ITU Policy Review will be conducted in selected countries to review national ICT in education initiatives and produce a detailed report containing both an evaluation against international benchmarks and a set of policy recommendations based on good practices supported by evidence
- Raised awareness on the opportunities and challenges of smart learning as well as digital transformation in the Arab region through the organization of two forums.
- Built capacities of policy-makers regionally in formulating national strategies for smart learning through the implementation of the signed cooperation agreement with the Telecommunication Regulatory Authority of the United Arab Emirates and the Mohamed Bin Rashid Smart Learning Programme. The first capacity building workshop took place in Dubai from 26-28 February 2017 with the participation of 18 participants from 10 countries.

310. ITU-T SG13 approved new **Recommendation ITU-T Y.2241 "Service framework to support web objects based ubiquitous self-directed learning"** provides a framework to support a web objects based ubiquitous self-directed learning (uSDL) service including overview, content object model, functional capabilities, security and trust considerations of web objects based uSDL. A work is in progress on application of a u-learning environment to the smart farming.

Action Line C7: E-Employment



311. The "High Level Dialogue on Digital Skills for Decent Jobs for Youth" session launched the joint ITU-ILO "Digital Skills for Decent Jobs for Youth" campaign to incentivize a range of stakeholders to train 5 million youth worldwide with job-ready digital skills by 2030. The Campaign has been launched under the "Global Initiative on Decent Jobs for Youth", supported by 22 UN agencies. ITU is leading the digital skills thematic area of the Global Initiative on Decent Jobs for Youth which seeks to scale up country action. ILO has launched an Engagement Platform at www.decentjobsforyouth.org where interested stakeholders can share their commitments to the campaign. Several of the participants in the WSIS High Level Dialogue have already added their commitments. More information about the campaign is also available at www.itu.int/digitalskills.

Action Line C7: E-Business

Related to the SDGs: SDG 1 (1.4), SDG 2 (2.3), SDG 5 (5.b), SDG 8 (8.3, 8.9, 8.10), SDG 9 (9.3), SDG 17 (17.11)

312. The Action line C7 E Business Facilitation meeting was held on Monday, 12 June 2017 as an integral component of the WSIS Forum 2017. The topic of the meeting was "E-commerce for Inclusive Trade and Sustainable Development". This session discussed the potential of e-commerce to contribute to the SDGs. The global e-commerce market is currently estimated at US$25.3 trillion, and the rapid growth of e-commerce contrasts with stagnant global trade in recent years. The session also noted that digital development strategies often lack an investment dimension. Significant investment is needed to close the digital divide, but less than a quarter of national digital development strategies contain plans to bridge the investment gap. Please read the outcome of the meeting here: https://www.itu.int/en/itu-wsis/Documents/wf17/WSISForum2017_ForumTrackOutcomes.pdf

313. The international community is looking to ITU's unique, globally representative public-private for a neutral platform to strengthen the ties between technical innovation, business needs and economic and policy requirements. ITU members at WTSA-16 approved new standards addressing Universal Service, charging and accounting principles for NGNs, developed an approach to reducing international roaming rates, and put forward principles and guidelines to assist countries in defining and identifying of operators with significant market power.

Action Line C8: Cultural diversity and identity, linguistic diversity and local content

Related to SDGs: SDG 2, SDG 4 (4.7), SDG 6 (6.b), SDG 8 (8.3, 8.9), SDG 11 (11.4), SDG 12 (12.b)

314. ITU actively facilitates access to and use of ICTs by Indigenous Peoples to contribute to their digital inclusion, social and economic development and preservation of their heritage and cultural legacy through the use of ICTs. In line with Plenipotentiary Resolution 184 (Guadalajara, 2010) and Output 4.3 of the WTDC-14 Dubai Action Plan and WTDC-14 Resolutions 46 and 68, BDT supports Member States in addressing specific needs of Indigenous People as regards to equitable access, use and knowledge of information communication technology (ICT's).in line with To achieve this goal, BDT in cooperation with the Indigenous Fund for Development of Indigenous Peoples from Latin Americas and Caribbean (Fondo Indígena para el Desarrollo de Pueblos Indígenas de America Latina y el Caribe- FILAC) has provided since 2005 an on-line training programme which benefits yearly almost 300 indigenous leaders in the Americas region by building their capacity to use telecommunications/ICTs for social and economic development responding to their requirements and expressed interests.

315. In the period 2014-2017 the training programme, which is provided yearly through the ITU Academy, consists of three online training courses on digital tools for the social and economic development of indigenous communities, as well as related web tools for the development, management and operation of local network radio stations. In 2017 the first course was held from 17 April to 24 June and the second one from 3 July to 26 August. The results of these two courses were successful and the last course will be delivered from 11 September to 3 November. Awareness of these tools was raised among members of indigenous communities through the BDT Indigenous Peoples website, which enjoyed between 15 000 and 17 000 views yearly.

316. ITU-T SG16 updated **Recommendation ITU-T H.625 "Architecture for network-based speech-to-speech translation services"** defines the system architecture for network-based speech-to-speech translation (S2ST) on the basis of Recommendation ITU-T F.745 and serves as a technical introduction to the subsequent definitions of detailed system components and protocols. The scope of this Recommendation is to describe the functional architecture and mechanisms of network based S2ST, interface protocols between S2ST modules, and a workflow of the network-based S2ST system. The revision includes additional information to clarify that H.625 could be applicable to both face-to-face communication and remote communication. The modality conversion mark-up language (MCML) is also enhanced for adding more flexibility.

Action Line C9: Media (also related to the 2030 Agenda for Sustainable Development)

Related to the SDGs: SDG 5 (5.b), SDG 9 (9.c), SDG 12 (12.8), SDG 16 (16.10)

317. As the Partner for Action line C9 Media, the ITU carries out several projects and activities. The Action line C9 facilitation meeting was held on Thursday 15 June 2017, as an integral component of the WSIS Forum 2017. The title of the meeting was "Strengthening Privacy, Encryption and Source Protection for Media Freedom and Internet Development". This meeting was focused on privacy, human rights on the Internet, encryption, protecting and reinforcing all human rights online and offline, UNESCO's Internet Universality framework and the related R.O.A.M principles amongst other relevant media related issues. Please read the outcome of the meeting here: https://www.itu.int/en/itu-wsis/Documents/wf17/WSISForum2017_ForumTrackOutcomes.pdf

318. A number of recommendations relevant to providing access to ICTs through terrestrial and satellite radiocommunication and broadcasting infrastructures have been established, and are under study currently, broadcasting infrastructures are particularly relevant in developing countries and/or underserved areas such as remote and sparsely populated areas.

319. Moreover, ITU carried out various studies for Internet Protocol TV (IPTV) that will enable enhanced, media rich delivery of content to users around the world, as well as Next Generation Networks (NGN) to reduce international imbalances affecting the media, particularly as regards infrastructure and technical resources. ITU-T is also working to enhance accessibility features of audio-visual media through the IRG AVA, and has organized three IPTV Application Challenges to promote innovative IPTV applications, and motivate experts across the broad IPTV ecosystem to develop original and creative IPTV applications based on ITU's suite of IPTV Recommendations.

320. Broadband cable networks have seen a new standard **ITU-T J.297 "Requirements and functional specification of cable set top box for 4K ultra high definition television"** for 4K Ultra High Definition Television set-top boxes with a functional specification of such cable set top boxes.

Recommendation ITU-T J.302 "System Specifications of Augmented Reality Smart Television Service" specifies the related technologies that should be implemented for augmented reality smart television system; allowing TV viewers to choose whether a user turns on the augmented content or watches the original TV content only (without the augmented content).

Recommendation ITU-T J.1104 "Control specification for IP-based switched digital video using Data Over Cable Service Interface Specifications" describes the operator control specifications of IP-based switched digital video (SDV) using data over cable service interface specifications (DOCSIS) in a digital cable networks.

321. **Recommendation ITU-T Y.Suppl.43 "ITU-T Y.1900-series – Deployment models of N-screen services"** describes three kinds of deployment model of N-screen services when user devices use the different protocols, metadata and stream formats to enable a user to view same media content on multiple user devices which the translation and adjustment

of content formats is necessary when the formats used in each user device are different. The service requirements are also specified when the deployment model is applied for the support of N-screen services.

Recommendation ITU-T X.609.3 "Managed P2P communications: Multimedia streaming signalling requirements" specifies signalling requirements for distributed multimedia streaming over managed P2P architecture. This Recommendation lists up requirements on all reference points that are defined in Recommendation ITU-T X.609 for providing multimedia streaming services. This Recommendation also describes high-level procedures for multimedia streaming services over managed P2P architecture, and roles of managed P2P components.

A family of video quality monitoring standards were developed to monitor the quality of video streaming over mobile devices as well as large screens with fixed-network connections. The standards are applicable to both progressive-download and adaptive-bitrate video streaming.

Experts have launched new standardization work on systems for Immersive Live Experience (ILE), which will bring the sensation of live events to remote audiences, replicating the experience of being present at the event venue.

SG16 approved new **Recommendation ITU-T H.763.2 "Scalable vector graphics for IPTV services"**; in March 2017 which describes the functionalities of SVG Tiny, which is issued by W3C, as one of multimedia application frameworks for IPTV services. According to different capabilities of terminal devices on supported services and processing performance, SVG Tiny is classified into "Basic Profile" and "Advanced Profile" for different IPTV terminal device models in this Recommendation. SVG basic profile is designed for the IPTV TD basic model [ITU-T H.721] and mobile model [ITU-T H.723], and SVG advanced profile is designed for the IPTV TD full-fledged model [ITU-T H.722]. SVG advanced profile supports more capabilities of two-dimensional graphics' rendering than SVG basic profile, particularly in styling, animation, multimedia and interactivity. ITU-T H.763.2 describes the required aspects of SVG modules, elements, attributes and properties to be supported by those two profiles. It also gives some typical example codes or simulation results.

Proprietary **digital-signage** solutions are available, but there is agreement that globally defined solutions have the potential to lower the cost entry point through, for example, the federation of content and reaching wide audiences.

Approved **Recommendation ITU-T T.621 "File structure for interactive mobile comic and animation content"** defines an interactive mobile comic and animation file structure used for organization and storage of mobile animation contents. ITU-T T.621 can be used as a guideline for creation, processing, transmission and play of mobile animation contents.

Recommendation ITU-T H.273 "Coding-independent code points for video signal type identification" defines various code points and fields that establish properties of a video (or still image) representation and are independent of the compression encoding and bit rate. These properties may describe the appropriate interpretation of decoded data or may, similarly, describe the characteristics of such signal before the signals compressed by an encoder that is suitable for compressing such an input signal.

ITU members have completed a family of **video quality monitoring** standards in the ITU-T P.1200 series of Recommendations. Developed by Study Group 12 the ITU-T P.1203 series standards provide model algorithms to monitor the quality of video streaming over mobile devices as well as large screens with fixed-network connections. The standards are applicable to both progressive-download and adaptive-bitrate video streaming and describe different model realizations for different levels of content encryption and computational complexity. ITU-T P.1203 currently supports quality estimations for HD video encoded using ITU-T H.264. ITU-T Study Group 12 is extending the standards to provide support for '4K' UHD video encoded using ITU-T H.264, ITU-T H.265 and VP9. ITU-T SG12 approved revised **ITU-T Supplement 26 (revised) to ITU-T P-series Recommendations "Scenarios for the subjective evaluation of audio and audiovisual multiparty telemeetings quality"**.

ITU-T SG9 has consented one draft Recommendation (under approval): **ITU-T J.2010 "Downloadable system for multi-CA/DRM service of mobile broadcasting; Service model and architecture"** provides a reference service model, architecture, and service operation protocols, which are needed for multi-Conditional Access(CA)/Digital Rights Management (DRM) based on downloadable scheme. The downloadable scheme means downloading CA/DRM client software images from Multichannel Video Programming Distributor (MVPD) or broadcaster to user's mobile terminal such as smart phone, tablet, and laptop PC. Service providers can change CA/DRM solutions for mobile device from one to the other using on-line method as well as operate multiple CA/DRM solutions at the same time.

322. An ITU Workshop on "TV and content delivery on Integrated Broadband Cable Networks", organized in Hangzhou, China, on 26 May 2017, considered the latest trends in cable television business and technologies, integrated services (TV, content and associated applications) delivery mechanisms and/or networks, innovative types of TV services, experiences and technologies, e.g. AR, VR, 3D, UHDTV (4k/8k), smart home, IoT), integrated smart terminals and/or related software, platforms for converged services for integrated broadband broadcast networks, and planning, implementation and deployment of cable television systems, networks and services, particularly for developing countries

323. During WTDC-14 Digital broadcasting has been identified as one of the regional initiatives in several regions, and ITU members have recognized the importance of managing the transition smoothly. ITU, in cooperation with Korea, Japan, and Australia, has provided assistance on Digital Broadcasting Transition with updating Guidelines for roadmap development for world-wide, and developed roadmaps for Afghanistan, Fiji, Indonesia, Lao PDR, Solomon Islands, Vietnam, Vanuatu, Guyana, Gabon, Democratic Republic of the Congo, Equatorial Guinea, Bangladesh, Pakistan, Micronesia, Samoa, Myanmar, Timor-Leste, Kiribati, Tonga, Bhutan and Nauru.

324. Also, in cooperation with the Latin-American Development Bank (CAF), ITU provided support to 8 countries (Bolivia, Dominican Republic, Venezuela, Costa Rica, Panama, Colombia, Paraguay and Jamaica) in the Americas Region and translated the guidelines into Spanish.

325. In addition, 5 other countries in Latin-America were assisted within the BDT Operational Plan.

326. Within the framework of the ITU-Latin-American Development Bank (CAF), a summary report on the digital broadcasting roadmaps, which includes 12 countries, has been prepared.

327. Case studies on the experiences in digital terrestrial television broadcasting transition for Thailand, Japan and Australia have been prepared. Also a report was prepared on the Interactive Multimedia Services and Pay TV in ASP.

328. Several workshops were delivered on the subject together the BDT and the BR all around the world. On 17 June 2015, on the date of the analogue switch-off in UHF bands in Region 1, ITU organized a Symposium on the Digital Broadcasting Transition.

329. ITU participated in the EBU (2016 June) and ABU (2015 October) Technical Assembly meetings.

330. ITU-ABU organized Pacific Media Partnership Conference 2015: Partnering for Broadcasting, Apia Samoa, 25-27 August 2015, Apia, Samoa (50 participants from 20 countries)

331. Regional Seminar for Europe and CIS on "Spectrum Management and Broadcasting was held with around 70 participants" in Rome on 29-31 May 2017. In 9 sessions, 45 presentations were delivered on, among others, the Future of digital terrestrial television broadcasting, Digital dividend utilisation, IMT 2020 (5G), Spectrum needs of IoT, etc.

332. ITU developed and is maintaining a database for following the transition from analogue to digital terrestrial television broadcasting:

http://www.itu.int/en/ITU-D/Spectrum-Broadcasting/Pages/DSO/Default.aspx

333. ITU Membership outreach:

ITU-R Outreach activities include the information and assistance to membership, the publication of ITU-R outputs and their dissemination, the organization of, and the participation in, seminars and workshops, and the development and maintenance of communication and promotion tools. The purpose of these activities is to ensure that the outputs produced by the ITU-R Sector (regulations, recommendations, reports and handbooks) are disseminated worldwide and familiar to the ITU membership and to stakeholders of spectrum, and that they form the basis for the formulation of spectrum management policies and decisions and for the use of radiocommunications in general. To carry out these activities, the BR relies on close cooperation with the other Bureaux and Sectors, the ITU regional and area offices and the relevant international organisations and national authorities.

Member States of ITU and Sector Members participate actively in the work of the Radiocommunication Sector. Since its opening to the private sector, the ITU membership represents a cross-section of the industry, from the world's largest manufacturers, carriers, operators and system integrators to small, innovative players of the new information and communication technology field.

Current members include:

- 193 ITU Member States, which constitute the Union, set its mandate and contribute to the work of ITU as a whole;

- More than 700 ITU Sector Members (which participate in the work of a defined Sector (R, T or D)) and ITU Associates (which work within the framework of a specific Study Group). These include operating agencies, scientific or industrial organizations, financial and developmental institutions, other entities dealing with telecommunication matters, regional and other international telecommunication, standardization, financial or developmental organizations;
- More than 100 academia members.

In its efforts to ensure the widest participation in the enhancement of worldwide communications and that the interests of all stakeholders are taken into consideration, ITU encourages new entities and organizations to join the Union as Sector Members or Associates. In addition, ITU seeks to further develop intellectual cooperation with educational institutions and universities.

Action Line C10: Ethical dimensions of the Information Society

Related to the SDGs: SDG 1, SDG 2, SDG 3, SDG 4, SDG 5, SDG 8, SDG 9, SDG 10, SDG 11, SDG 12, SDG 13, SDG 16, SDG 17.

334. The Action line C10 E Business Facilitation meeting was held on Monday, 12 June 2017 as an integral component of the WSIS Forum 2017. The topic of the meeting was "Ethical and Legal Implications of Darknet". This session addressed some of the legal and ethical challenges of the Darknet, as well as discussing the questions, can you legally manage and block fallout of darknet within the existing legal and policy regime?, and, hat are ethical implications of the Darknet?. Please read the outcome of the meeting here: https://www.itu.int/en/itu-wsis/Documents/wf17/WSISForum2017_ForumTrackOutcomes.pdf

(d) United Nations Group on the Information Society (UNGIS)

335. UNGIS was endorsed by the CEB in April 2006 and it serves as an interagency mechanism to coordinate substantive policy issues facing the United Nations system's implementation of the Geneva Plan of Action and Tunis Agenda for the Information Society adopted by the World Summit on the Information Society, thereby contributing to improving policy coherence in the UN system, as requested by the 2005 World Summit.

336. ITU took over the Chairmanship of UNGIS in 2017.

337. At its annual gathering at the WSIS Forum 2017, the United Nations Group on the Information Society (UNGIS) held its 14th High-level and Working-Level meetings. During the working-level meeting the annual rolling work plan was prepared and endorsed by the members.

338. One of the items for the work-plan follow up is para 12 of Outcome document of the high-level meeting of the General Assembly on the overall review of the implementation of the outcomes of the World Summit on the Information Society, adopted on 16 December 2015. It reads:

> "We commit to harnessing the potential of information and communications technologies to achieve the 2030 Agenda for Sustainable Development and other internationally agreed development goals, noting that they can accelerate progress across all 17 Sustainable Development Goals. We accordingly call on all Governments, the private sector, civil society, international organizations, the technical and academic communities and all other relevant stakeholders to integrate information and communications technologies into their approaches to implementing the Goals, and request United Nations entities facilitating the World Summit on the Information Society action lines to review their reporting and work plans to support implementation of the 2030 Agenda."

339. A calendar of UNGIS member's events and a joint contribution to the HLPF 2018 are some of the tasks ITU is leading as the chairman of UNGIS.

340. ITU continues to provide secretariat support to UNGIS and maintains the official UNGIS webpage www.ungis.org.

(e) Measuring the Information Society (Para113-119 of TAIS)

ITU continues to monitor the development of the digital divide, through appropriate benchmarks and indicators. ITU maintains the World Telecommunication/ICT Indicators Database, which is updated twice a year (in June and in December), disseminated widely and accessible online. To improve data availability and comparability, ITU works closely with its member states, particularly the Ministries in charge of telecommunication, regulatory agencies, and national statistical offices.

In 2016-17, more than 180 statistical indicators from over 200 economies worldwide were collected through five annual questionnaires. The data were disseminated through the ITU website, online portal, electronic download and USB-key and printed publications such as the **42nd edition of the Yearbook of Statistics**, and the **21st (June 2017) edition of the World Telecommunication/ICT Indicators database (WTID)**, available for both Windows and Mac users.

In July 2017, ITU published the **"ITU ICT Facts and Figures 2017"** featuring end-2017 estimates for key telecommunication/ICT indicators, including youth Internet user, digital gender gap, fixed-broadband subscriptions by speed and technology, mobile and fixed-broadband access and affordability, international bandwidth, and telecommunication

revenues. 2017 marks the second year of implementation of the 17 Sustainable Development Goals (SDGs) and their 169 targets. ITU data inform public and private sector decision makers, and help ITU accomplish its mission: to make use of the full potential of ICTs for the achievement of the SDGs.

ITU is an active member of the Partnership on Measuring ICT for Development[33] and one of the three members of its Steering Committee, together with UNCTAD and UIS. The Partnership has been very active in tracking the progress of the WSIS Targets, has made a concerted effort to highlight the role that ICTs will play in achieving the SDGs and has taken a lead role in increasing awareness about the importance of ICT for development and in international ICT monitoring. The Partnership has developed a core list of ICT indicators as well as associated statistical standards and methodologies, in close consultation with experts from National Statistical Systems. The core list, which has been endorsed by the United Nations Statistical Commission, provides the basis for the production of ICT statistics in countries all over the world. In 2017, the Partnership discussed and agreed on the process to adopt new indicators or to revise existing core indicators.

PARTNERSHIP ON MEASURING ICT FOR DEVELOPMENT

The Partnership is actively engaged in monitoring the Sustainable Development Goals. The 2030 Agenda for Sustainable Development recognizes 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". Several SDG targets refer to ICTs and technology, highlighting the need to include specific ICT indicators in the monitoring framework. Nevertheless, in the global SDG indicator framework, which will help monitor progress, identify challenges, and guide policy makers, out of 231 only 7 ICT indicators are included, covering 6 targets under Goals 4, 5, 9, and 17. Five of the seven indicators are collected and disseminated by the ITU.

During the 2017 WSIS Forum, the Partnership organised a session on "Measurement of Progress towards the SDGs through ICT Indicators". The contribution of ICTs to achieving the SDGs has been recognized by the WSIS, the Commission on Science and Technology for Development and the UNGIS. During the session, panellists stressed the role ICTs will play in achieving the SDGs and highlighted the importance of appropriate ICT indicators to measure the progress towards the SDGs, which goes beyond the seven indicators that are included in the global indicator framework. At the end of the session, the Partnership officially launched the Task Group on ICT for the SDGs. The main objective of the Task Group is to propose a thematic list of ICT indicators that could be used to measure ICT

[33] The Partnership on Measuring ICT for Development is an international, multi-stakeholder initiative that was launched in 2004 to improve the availability and quality of ICT data and indicators, particularly in developing countries. The Partnership has guided policy makers in producing ICT statistics that are crucial to informed decision-making, including through the identification of a core list of ICT indicators and methodologies to collect these indicators. The Partnership helps developing countries collect ICT statistics, particularly through capacity-building and hands-on training for national statistical offices, and collects and disseminates information society statistics. Its membership has grown from originally 11, to today 14 regional and international organisations: ITU, UNCTAD, UNDESA, UNESCO Institute for Statistics (UIS), ILO, UNEP-SBC, UNU-ViE SCYCLE, World Bank, UNECA, UNECLAC, UNESCAP, UNESCWA, EUROSTAT and OECD.

availability and use in sectors relevant to the SDGs that are not covered in the global SDG indicators framework. The TG will further aim at improving availability of disaggregated data, for the indicators that will be defined in the thematic list, in addition to the ICT indicators included in the SDG measurement framework.

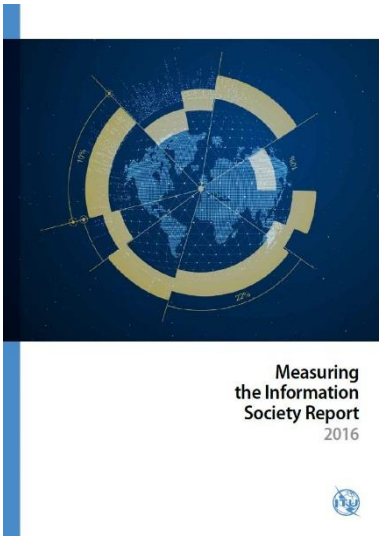
Finally, also in the context of the 2030 Agenda, the Partnership provided a briefing note to the High Level Political Forum 2017 with inputs on the contribution of the Partnership towards the 2030 Agenda in general, and particularly for the Sustainable Development Goals (SDGs) and respective targets that are most related to ICTs.

The **8th Meeting of the Expert Group on Telecommunication/ICT Indicators (EGTI)** and the **5th Meeting of the Expert Group on ICT Household Indicators (EGH)** will take place back-to-back in Geneva, from 12 to 15 September 2017. More than 120 participants from the national statistical offices, ministries, regulators, international and regional organizations, and the private sector are registered to attend the EGTI/EGH meeting. The EGH meeting will discuss the following: a) new e-commerce indicators; b) response categories for the existing SDG 4.4.1 indicator on ICT skills; c) definition of smartphones and new indicators on smartphone use and ownership; d) location of Internet use through Wi-Fi connections; and e) data availability and disaggregation of ICT statistics to ensure 'no one is left behind' in ICT access and use. Countries will also highlight their experiences in planning, designing, and implementing household surveys. On the other hand, key discussion topics for the EGTI meeting will be the following: a) revisions to the ITU ICT price baskets; 2) new fixed-network coverage indicators; 3) definition of broadband and fixed-broadband speed tiers; 4) OTT services and IP convergence; 5) cybersecurity indicators; and 6) indicators for wireless spectrum allocation. The EGTI and EGH will have a joint session that will discuss two topics: data dissemination/visualization and use of Big Data for official statistics, in which ITU will share the first results from its Big Data pilot projects.

An Extraordinary Meeting of the EGTI and EGH was held on 1-3 March 2017. The Extraordinary Meeting discussed and agreed on a revised set of indicators to be included in ITU's ICT Development Index (IDI), based on two input documents prepared by the EGTI/EGH sub-group and an independent group of experts. The ITU has published the IDI values and country rankings annually since 2009 as part of the effort to track and compare ICT developments between countries and over time. The Extraordinary Meeting adopted 14 indicators to be included in the IDI compared to the current list of 11 indicators. For information summarizing the changes to the list of IDI indicators, please see: http://www.itu.int/en/ITU-D/Statistics/Pages/events/eghegti2017/default.aspx. The results of the revised IDI will be published in 2018, to provide sufficient time to undertake statistical tests and to allow countries to gather and report data on the new indicators.

The **14th World Telecommunication/ICT Indicators Symposium (WTIS)** took place in Gaborone, Botswana, from 21 to 23 November 2016. It was hosted by the Government of Botswana and included a Ministerial Roundtable discussing national initiatives on how to close the digital divide and to ensure an inclusive information society. The WTIS also featured an international high-level dialogue on understanding the structural impact of ICTs and saw the launch of the 2016 Measuring the Information Society Report (MISR) and the ICT Development Index (IDI). The other sessions of the

WTIS 2016 focused on the following topics: big data for monitoring the information society, ICT indicators for disaster risk reduction, and stakeholder perspectives on better ICT data for better policy-making. The results of the work of the Expert Group on Telecommunication/ICT Indicators (EGTI) and the Expert Group on Household indicators (EGH) were presented for adoption by the WTIS.



The **2016 edition of the Measuring the Information Society Report** (MISR) was launched during the 14th World Telecommunication/ICT Indicators Symposium (WTIS-16), in Botswana. The Measuring the Information Society Report, which has been published annually since 2009, features key ICT data and benchmarking tools to measure the information society, including the ICT Development Index (IDI). The IDI 2016 captures the level of ICT developments ¡n 175 economies worldwide and compares progress made since the year 2014. The report assessed IDI findings at the regional level and highlighted countries that ranked at the top of the IDI and those that have improved their position in the overall IDI rankings most dynamically since 2014. It also used the findings of the IDI to analyze trends and developments in the digital divide. The report presented 2015 prices for about 160 countries and provided a detailed analysis of mobile-cellular, fixed-broadband and mobile-broadband prices over the period 2008-2015. It highlighted the role of ICTs in achieving the Sustainable Development Goals and presented the newly agreed SDG indicator framework, including the ICT indicators. The report also included a chapter looking into new metrics to measure mobile uptake, and a chapter presenting data analyzing Internet use and uptake.

The **15th World Telecommunication/ICT Indicators Symposium (WTIS-17)** will take place in Hammamet, Tunisia, from 14 to 16 November 2017 and will be hosted by the Government of Tunisia. The WTIS-17 will feature a high-level plenary session to discuss the role of data in formulating public policies that foster a healthy investment climate. Additionally, there will also be plenary sessions that focus on: big data for monitoring the information society, measuring emerging ICT trends, and smart data for smart sustainable cities (SSCs). Parallel sessions will be featured for the first time during the WTIS-17. Through the different parallel sessions, participants will have opportunities to join a selection of demos, tutorials and lightning talks on data visualization and Big Data analysis tools, crowdsourcing data, next-generation networks and digital economy measurement. As in previous years, the results of the work of the Expert Group on Telecommunication/ICT Indicators (EGTI) and the Expert Group on Household indicators (EGH) will be presented for adoption by the WTIS. The 2017 Measuring the Information Society Report (MISR) and the ICT Development Index will be also be launched during the WTIS-17. Finally, the Symposium will close with a multi-stakeholder panel that will discuss how emerging technologies can be transformed into economic opportunities with better data.

The **2017 edition of the Measuring the Information Society Report (MISR)** will be launched during the 15th World Telecommunication/ICT Indicators Symposium (WTIS-17) in Hammamet, Tunisia. The MISR has been published annually since 2009 and it regularly features analysis of key ICT data and benchmarking tools to measure the information society, including the ICT Development Index. The IDI 2017 captures the level of ICT developments in 176 economies worldwide and compares progress made since the year 2015. The report will assess IDI findings at the regional level and highlight economies that ranked at the top of the IDI as well as those that have improved the most in their IDI results since 2015. It will also use the IDI findings to analyze trends and developments in the digital divide. The 2017 MISR will include a separate volume devoted to individual country profiles providing a snapshot of each country's latest ICT landscape as well as national initiatives to increase ICT access, use and proficiency. In addition to the analytical chapters, the report will be complemented by statistical tables providing country-level data for indicators included in the IDI as well as annex tables on 2016 prices for mobile-cellular, fixed-broadband and mobile-broadband prices in about 160 countries.

(f) Maintaining the WSIS Stocktaking Database (Para 120, Tunis Agenda) and a portal for best practices and success stories (Para 28, Geneva Plan of Action).

The WSIS Stocktaking process has been maintained by ITU since 2004 as requested by the WSIS Outcomes (TAIS, Para 120). This **publicly accessible WSIS Stocktaking database** (www.wsis.org/stocktaking), currently with 9.000 plus entries and a growing community of 300.000 stakeholders, is a unique global tool for collecting information and regular reporting on information and communication technology related initiatives and projects, carried out by governments, international organizations, the private sector, civil society, academia and other entities, in the context of 11 WSIS Action Lines.

In 2015, the UN General Assembly within the framework of the ten year review of the WSIS (Res. A/70/125) called for a close alignment between the WSIS process and the 2030 Agenda for Sustainable Development (Res. A/70/1). The WSIS Stocktaking process responded by highlighting the contribution of 11 WSIS Action Lines to the achievement of 17 Sustainable Development Goals (SDGs).

The United Nations Economic and Social Council ECOSOC resolution 2017/22 on "Assessment of the progress made in the implementation of and follow-up to the outcomes of the World Summit on the Information Society" reiterates the importance of sharing best practices at the global level, and, while recognizing excellence in the implementation of the projects

and initiatives that further the WSIS goals, encourages all stakeholders to submit ICT-related projects and initiatives to the WSIS Stocktaking platform.

ITU is pleased to invite you to update and submit new entries online at www.wsis.org/stocktaking by **9 February 2018**. Submitted activities will be reflected in the **WSIS Stocktaking Report 2018**, which will be released at the WSIS Forum 2018 to be held from 19 to 23 March 2018 at ITU Headquarters, Geneva.

(g) Emergency Telecommunications (Para 91 of TAIS)

ITU deploys emergency telecommunication equipment to Zimbabwe

341. In March 2017, ITU deployed emergency telecommunication equipment to Zimbabwe, when the Ministry of Information Communication Technology, Postal and Courier Services requested assistance from ITU after the devastation caused by severe floods. Many homesteads and schools were destroyed and many lives have been lost during this emergency. The equipment was used to coordinate recovery and rehabilitation activities, including providing communication to the most affected communities in the country.

ITU deploys emergency telecommunication equipment to Haiti

342. In October 2016, ITU deployed emergency telecommunication equipment in response to the government of Haiti's request for assistance, which had been hit by devastating Category 4 Hurricane Matthew. The most powerful Caribbean Hurricane in the last decade caused loss of lives and damage to power, communication, and transport and other infrastructure such as water and healthcare. Many communities were affected and access to the devastated areas was limited. The emergency telecommunication equipment provided included satellite phones and accessories, which were used to support relief and coordination efforts.

ITU deploys emergency telecommunication equipment to Sri Lanka

343. In May 2016, ITU deployed emergency telecommunication equipment in response to the government of Sri Lanka's request for assistance. Torrential rain caused loss of lives and destruction to infrastructure including telecommunications, power lines and roads. Many communities were affected and access to the affected areas were limited. The emergency telecommunication equipment provided included satellite phones, satellite broadband terminals and accessories, which were being used to support relief and coordination efforts.

ITU deploys emergency telecommunication equipment to Ecuador

344. Emergency telecommunications equipment was deployed to Ecuador after the devastation caused by the 7.8 earthquake that struck the country on 26 April 2016. The ITU satellite equipment was delivered directly to the Manabi Province, the most affected area of the coast of Ecuador. The strong quake caused a lot of destruction to infrastructure including telecommunication networks, powerlines and roads. The emergency telecommunication equipment provided include satellite phones, satellite broadband terminals and accessories, which are being used to support search and rescue efforts as well as recovery and reconstruction activities.

ITU deploys emergency telecommunication equipment to Fiji

345. ITU deployed emergency telecommunication equipment in response to the Government of Fiji request for assistance. Category-five Cyclone Winston crashed into Fiji Islands on February 20, 2016 bringing winds of over 325km/h, torrential rain and high sea waves. Tropical Cyclone Winston caused loss of lives and destruction to infrastructure including telecommunications, power lines and roads. Many villages have been destroyed on the island of Koro, North-East of the main island Viti Levu where the capital Suva is located. Damages across the East Division are extensive and access to the area was limited. The emergency telecommunication equipment provided include satellite phones, satellite broadband terminals and accessories, which are being used to support relief and coordination efforts. (22 February 2016)

ITU deploys emergency telecommunication equipment to Commonwealth of Dominica

346. ITU deployed emergency telecommunication equipment in response to the Government of Dominica's request for assistance while Tropical Strom Erika lashed at the island causing loss of lives and infrastructure. Heavy rains, severe flooding and landslides wreaked widespread damage across the island in the Lesser Antilles region of the Caribbean Sea. The emergency telecommunication equipment includes satellite phones, Broadband Global Area Networks, solar chargers, laptops and accessories, which are being used to support relief and coordination efforts. (27 August 2015)

(h) International Internet Connectivity (Para27c.ii and 50d of TAIS)

347. ITU-T Study Group 3 continues to study this matter. BDT is providing assistance to East African Community (EAC) and South African Development Community (SADC) countries on the creation of national Internet Exchange Points (IXPs) and achieving efficient and cost effective Regional Internet connectivity.

348. ITU Workshop on the establishment of Internet Exchange Points (IXPs) to advance inter-connectivity, 28 September 2015, Geneva, Switzerland.

Paragraph 50 of the Tunis Agenda calls for the establishment of national, regional and sub-regional Internet exchange points (IXPs) as a strategy for increasing affordable global connectivity, thereby facilitating improved and equitable access for all. This call has been reinforced repeatedly including in Opinion 1 of WTPF 2013 and PP14 Resolutions 101 and 102.

This workshop, co-organized by BDT and TSB, aims to provide insights on the value of IXPs in leveraging the benefits of connectivity through potentially reduced transmission costs, optimized Internet traffic, and improved Quality of Service among others. This workshop l discussed widely accepted best practices for the design, installation and operation of IXPs. Issues concerning peering as an effective way for Internet Service Providers (ISPs) to improve the efficiency of operations and interconnection business relationships were also discussed, including related policy and regulatory challenges.

349. ITU-D Study Group 1 Question 1/1 within its work items for the 2014-2017 study period is studying some of the existing resources available, including case studies received, related to the deployment of Internet Exchange Points (IXPs) with an aim to prepare best practice guidelines that may be useful for the Member States. As an example, an empirical study of Kenya and Nigeria assessing the impact of IXPs in these two Sub-Saharan countries has been considered. The Group is examining how IXPs can be used to improve connectivity, how they can improve the quality of Internet services provided and potentially save operators money in connectivity fees. Other contributions to the work of the Group looks at the critical cost and performance benefits of IXPs in countries in the Americas (Argentina, Brazil, Colombia and Ecuador), and how they have been able to advance Internet growth in this region. While the Study Group will compile its final findings for the World Telecommunication Development Conference in 2017, the ITU Membership can take part in the work achieved to date and contribute to the discussions during its regular meetings and using online collaboration tools.

(i) World Telecommunication and Information Society Day

350. World Telecommunication Day has been celebrated annually on 17 May since 1969, marking the date of the founding of ITU and the signing of the first International Telegraph Convention in 1865. It was formally instituted by the Plenipotentiary Conference in Malaga Torremolinos in 1973. In recognition of ITU as the lead United Nations agency for telecommunications and information and communication technologies (ICTs), the World Summit on the Information Society (WSIS) in Tunis, November 2005, called on the United Nations General Assembly to proclaim 17 May as World Information Society Day (see paragraph 121 of the Tunis Agenda).

351. On 27 March 2006, the United Nations General Assembly adopted Resolution 60/252, proclaiming 17 May as World Information Society Day to focus global attention annually on bringing the enormous benefits of the digital revolution in ICTs to the world's inhabitants.

352. The ITU Plenipotentiary Conference in November 2006 welcomed the General Assembly's decision and amended Resolution 68 to invite the Council to adopt a specific theme for each World Telecommunication and Information Society Day.

353. World Telecommunication and Information Society Day 2017

2.1 The theme for WTISD-17, "Big Data for Big Impact," focused on the power of Big Data for development and aimed to explore how to turn imperfect, complex, often unstructured data into actionable information in a development context. The insight brought on by advanced analysis can strongly complement the evidence-based nature of decision-making that can be leveraged at national, regional and international levels to drive success towards attaining all 17 of the United Nations' Sustainable Development Goals (SDGs) for 2030.

2.2 A debate was held at ITU on 17 May 2017 which brought together participants from CERN, GSMA, Swisscom and UNICRI who discussed all aspects of the impact of Big Data in front of an audience of Council delegates. This debate was very lively and included a Question and Answer session with the audience.World Telecommunication and Information Society Day 2018

354. WTISD-18 will mark the 153rd anniversary of ITU, highlighting the theme: "Enabling the positive use of Artificial Intelligence for All", in line with ITU Plenipotentiary Resolution 68 (Rev. Guadalajara, 2010) and as decided by Council 2016.

3.2 Artificial Intelligence (AI) has enormous potential to assist global efforts to address challenges as great as poverty, hunger, health, education, equality and the protection of our environment. Inclusive global dialogue will be fundamental in building the common understandings necessary to guide AI innovation towards the achievement of the UN Sustainable Development Goals.

3.3 AI is certain to influence many areas of ITU's technical work, with examples found in data management, network orchestration, video coding, intelligent transport systems, and Internet of Things and smart cities.

(j) Bridging the standardization gap (BSG) –

355. The successful hands-on capacity-building training conducted by ITU T SG3 since early 2014 has been extended to other study groups and their regional groups. These BSG Hands-On sessions are geared towards assisting developing countries in acquiring the right skills and capabilities for international standards-making and to draft contributions for meetings. The sessions focus on the development of practical skills to maximize the effectiveness of developing countries' participation in the ITU-T standardization process, covering topics including strategies for participation in Study Groups, drafting Contributions, presenting proposals, collaborative working methods and means of gaining support and building consensus.

356. Since January 2016, 12 hands-on training sessions were held for delegates of ITU-T SG2, SG9, SG11, SG12, SG13, SG16 and SG17. In total, 195 participants from 36 countries and 66 different organizations have benefited from these sessions. These sessions focused on 5 key aspects set out in the Figure X.

Figure X - KEY ASPECTS OF BSG HANDS-ON SESSIONS

357. At the kind invitation of the Telecommunications Authority of Trinidad and Tobago (TATT), ITU organised a Regional Standardization Forum (RSF) for the Americas on 6 March 2017.

358. The main objectives of the event are to provide examples of best practices to developing countries on global standards development, build national standards readiness and facilitate the establishment of a national standardization secretariat to coordinate participation in ITU-T study groups. The Forum will also discuss the standardization activities ongoing in ITU-T study groups which are of interest to the region including economic, policy and operational aspects of ICT/Telecommunications.

359. A As per Council Resolution 1343, the **Radiocommunication Assembly 2015 (RA-15)** was held in Geneva from 26 to 30 October 2015 with 457 participants representing 96 Administrations and 38 Sector Members and Academia.

RA-15 approved the work programme and Questions of the Radiocommunication Study Groups (see Resolution ITU-R 5, http://www.itu.int/pub/R-RES-R.5) as well as six draft ITU-R Recommendations and a draft ITU-R Question submitted to the Assembly.

In total, 36 new or revised ITU-R Resolutions were approved, including:

Resolution ITU-R 55 - ITU-R studies of disaster prediction, detection, mitigation and relief (http://www.itu.int/pub/R-RES-R.55)

Resolution ITU-R 65 - Principles for the process of future development of IMT for 2020 and beyond (http://www.itu.int/pub/R-RES-R.65)

Resolution ITU-R 66 - Studies related to wireless systems and applications for the development of the Internet of Things (IoT) (http://www.itu.int/pub/R-RES-R.66)

Resolution ITU-R 67 - Telecommunication/ICT accessibility for persons with disabilities and persons with specific needs (http://www.itu.int/pub/R-RES-R.67)

Resolution ITU-R 68 - Improving the dissemination of knowledge concerning the applicable regulatory procedures for small satellites, including nanosatellites and picosatellites. (http://www.itu.int/pub/R-RES-R.68)

Resolution ITU-R 69 - Development and deployment of international public telecommunications via satellite in developing countries (http://www.itu.int/pub/R-RES-R.69).

The decisions of RA-15 of particular relevance to WRC-15 were reported in Document WRC-15/216 (http://www.itu.int/md/R15-WRC15-C-0216/)

360. **Free on-line access to ITU-R Publications for bridging the standardization gap**

The ITU free online access policy continues to provide a very large dissemination of ITU standards to a broader public, especially in developing countries with financial and technical constraints. This wide outreach via free online access is helping to build the visibility of ITU's mission and mandate and reinforce ITU as a global telecommunication authority.

By Decision 12 (Guadalajara, 2010), PP-10 adopted a free online access policy to include, inter alia, ITU-R Recommendations and Reports. This policy was expanded by Council 2012 Decision 571, revised by Council 2013 and 2014 , and confirmed by PP-14 revised Decision 12, which provides free online access for the general public, on a permanent basis, to ITU-R, ITU-T and ITU-D Recommendations and Reports; ITU-R handbooks on radio-frequency spectrum management[34]; ITU publications concerning the use of telecommunications/ICTs for ensuring disaster preparedness, early warning, rescue, mitigation, relief and response; the International Telecommunication Regulations (ITRs); the Radio Regulations; the Rules of Procedure; the basic texts of the Union (Constitution, Convention, General Rules of conferences, assemblies and meetings of the Union, decisions, resolutions and Recommendations); the final acts of plenipotentiary conferences; the final reports of WTDCs; the ITU Council resolutions and decisions; the final acts of world and regional radiocommunication conferences; and the final acts of world conferences on international telecommunications.

[34] These include the ITU-R Handbooks on National Spectrum Management; Computer Aided Techniques for Spectrum Management; and Spectrum Monitoring.

ITU-R Recommendations

As a result of the free online access policy, ITU-R Recommendations have been disseminated worldwide, becoming a universal reference, reaching all audiences, regardless their economic situation. In a 36-month period (January 2013 to December 2015), more than ten million downloads of ITU-R Recommendations from ITU web site were recorded. Table 8.1.4.2-1 summarizes their distribution by year and series. At this time there are 1,155 ITU-R Recommendations in force, hence the average number of downloads is 9,300 per Recommendation.

ITU-R Reports

As ITU-R Recommendations, ITU-R Reports have been disseminated worldwide, becoming a universal reference, reaching all audiences, regardless of their economic situation. In a 36-month period (January 2013 to December 2015), more than 4.5 million downloads of ITU-R Recommendations from ITU web site were recorded. Table 8.1.4.3-1 summarizes their distribution by year and series. At present, there are 410 ITU-R Reports in force, with an average download of 8,000 per Report.

Navigation and analysis tools for ITU-R electronic publications:

Radio Regulations tools: the Radiocommunication Bureau developed software tools to facilitate the use and analysis of the Radio Regulations which is available for subscription and download since the first quarter of 2016 - www.itu.int/pub/R-REG-RRX

ITU-R documents database search tool

At its 19th meeting, the RAG invited the BR Director to develop a database, within existing budgetary limitations, that would enable ITU-R Recommendations to be searched and filtered by categories such as the radiocommunication service(s) and applicable frequency band. In collaboration with ITU's IS Department, the search tools for ITU-R Recommendations and ITU-R Questions became operational in October 2015, a search tool for the ITU-R Reports became available as a demonstration version in November 2015, and search tools for the ITU-R Resolutions and the Handbooks are expected to be available during the 2nd quarter of 2016.

(k) Internet Governance Forum

ITU will be participating in the 12th IGF meeting to be held from 17 to21 December 2017 in Geneva, Switzerland. Within the framework of IGF 2017, ITU and UN Women will be co-organizing on 19 December the fourth annual EQUALS in Tech Awards (formerly GEM-Tech Awards) to celebrate initiatives that are closing the gender digital divide. The ceremony will be followed by an EQUALS in Tech Panel Discussion on 20 December. ITU will further co-organize two Open Forums a) with other WSIS Action Line facilitators on "WSIS Action Lines advancing the Achievement of SDGs"; b) with DiploFoundation and SSIG on "Strengthening capacities in international Internet governance". ITU Secretary-General will be representing ITU at the IGF 2017 Opening Ceremony and the High Level Thematic Session on "Shaping our future digital global governance". ITU will further be involved as a speaker in several sessions organized by various stakeholders.

IV. ITU Role in the Overall Review of the Implementation of the Outcomes of the World Summit on the Information Society

(a) UNGA Overall Review of the Implementation of the WSIS Outcomes

361. Paragraph 111 of the Tunis Agenda, endorsed by the General Assembly in resolution 60/252 , requested the General Assembly to undertake the overall review of the implementation of the outcomes of the World Summit on the Information Society in 2015. In response, the General Assembly in resolution 68/302 , decided that the overall review will be concluded by a two-day high-level meeting of the General Assembly, to be preceded by an intergovernmental process that also takes into account inputs from all relevant stakeholders of the World Summit on the Information Society. Co-Facilitators of the UNGA Overall Review appointed by the President of the UNGA are Ambassador Jānis Mažeiks, Ambassador of Latvia and Ambassador Lana Zaki Nusseibeh, Ambassador of the United Arab Emirates.

362. ITU contributed to the WSIS Review with the 2015 ITU contribution to WSIS Report and organized the following sessions and meetings:

- Strengthening the impact of WSIS Action Lines for sustainable development: showcasing best practices, transferring know-how, fostering partnerships, Monday 14 December 2015, 13:15 - 14:30, UNHQ, Conference Room 11
- GEM-TECH Awards 2015, Monday 14 December 2015, 18:00 - 20:00, Civic Hall, New York
- UNGIS Breakfast Meeting, Tuesday 15 December 2015, 08:00 - 08:45, WIPO Conference Room, 25 Floor UN Plaza 2, New York
- Women's Empowerment in the Digital Age: Implementing WSIS Outcomes and Agenda 2030, Tuesday 15 December 2015, 13:00 - 14:30, UNHQ, Conference Room 6
- Measuring the Information Society: ICT Data for Policy Making and Evaluation, Tuesday 15 December 2015, 15:00 - 16:45, UNHQ, Conference Room A
- Enabling a Trusted Connected World, Wednesday 16 December 2015, 13:15 - 14:30, UNHQ, Conference Room 7

363. **ITU** is part of a special Task Force of Representatives of UN Agencies Represented in NY and Supporting the Preparatory Process. ITU is also an active part of a UN Communication Team for UNGA Overall Review (ITU, UNCTAD, UN DPI, UN OPGA, DESA. ITU facilitated the preparation of the CEB Joint Statement on the WSIS Overall Review (content to be coordinated through the UNGIS mechanism). ITU disseminates information on the process to the WSIS implementation community through the WSIS Flash.

V. Forums, innovative initiatives and future actions

(a) Forums

WSIS Forum 2017 Event and its outcomes:

364. The WSIS Forum builds upon the outcomes of the UN General Assembly Overall Review of the Implementation of the WSIS Outcomes (UNGA Resolution A/70/125) that recognized the necessity of holding this Forum on an annual basis and called for a close alignment

between WSIS and the 2030 Agenda for Sustainable Development. In this context, the WSIS Forum leverages on the WSIS-SDG Matrix and serves as a key forum for discussing the role of ICTs as a means of implementation of SDGs, with due regard to the global mechanism for follow up and review of the implementation of the 2030 Agenda (UNGA Resolution A/70/1). The WSIS Forum is coordinated by ITU and has been co-organized since 2006 by ITU, UNESCO, UNDP and UNCTAD with the engagement of other United Nations Agencies, including WIPO, UNDESA, FAO, ILO, UNIDO, ITC, UNHCR, UNICEF, UNODC, UNEP, UPU, WMO, WHO, WFP, UN Women, UN Regional Commissions.

365. WSIS Forum 2017 was held from the 12-16 June at the ITU Headquarters, Geneva, Switzerland. This year the Forum attracted more than 2000 WSIS Stakeholders from more than 150 countries. Thousands followed remotely while more than 500 were engaged by intervening remotely. More than 500 high-level representatives of the wider WSIS Stakeholder community graced the Forum with more than 85 ministers and deputies, several ambassadors, CEOs and Civil Society leaders contributing passionately towards the programme of the Forum. Building on the outcomes of the multitakeholder open consultation process, over 200 content rich workshops were organized clearly showcasing the linkages between the WSIS Action lines and SDGs. In addition, 18 WSIS Prizes winners and 70 WSIS Prizes champions were acknowledged for their excellent work in implementation of the WSIS Action Lines on the ground.

366. The Chairman of the WSIS Forum 2017 was H.E. Mr. Jean Philbert Nsengimana, Minister of Youth and ICT, Rwanda. The high-level policy sessions were moderated 14 by High-Level Track Facilitators nominated and identified by the different WSIS Stakeholders types https://www.itu.int/net4/wsis/forum/2017/#highlevel.

367. With the objective of strengthening the alignment of WSIS and SDG processes, the overall theme for WSIS Forum 2017 was Information and Knowledge Societies for SDGs. In particular, in order to highlight the contribution of the WSIS Action Lines in accelerating the achievement of the SDGs, the ITU coordinated, with the UN Action Line Facilitators, UNDESA, UNESCO, UNCTAD, ITU, UPU, WHO, ILO, WMO, UNEP, a document that focuses on the impact of the respective Action Lines on the HLPF 2017 theme "Eradicating poverty and promoting prosperity in a changing world". It further seeks to encourage and promote effective multistakeholder cooperation in implementation of WSIS Action Lines and the SDGs. The report is available here: https://www.itu.int/net4/wsis/forum/2017/#outcomes

368. WSIS Forum 2017 resulted in several concrete outcomes that will enable stakeholders to strengthen implementation of WSIS Action Lines and the alignment of the WSIS and SDG processes https://www.itu.int/net4/wsis/forum/2017/#outcomes :

1. WSIS Forum 2017 Outcome Document: http://www.itu.int/en/itu-wsis/Documents/wf17/WSISForum2017_ForumTrackOutcomes.pdf
2. WSIS Forum 2017 Outcomes linked to WSIS Action Lines SDGs Sustainable Development Goals - Matrix Flyer: http://www.itu.int/en/itu-wsis/Documents/wf17/WSISForum2017_WSIS-SDGsMatrix_F.pdf
3. WSIS Forum 2017 High Level Track Outcomes and Executive Brief http://www.itu.int/en/itu-wsis/Documents/wf17/WSISForum2017_HighLevelTrackOutcomesStatements.pdf

4. WSIS Forum 2017: WSIS Action Lines—SDGs Heatmap: Building on the WSIS-SDG Matrix developed by UN WSIS Action Line Facilitators, a mapping tool was made available to emphasize the linkages between the Action Lines and the SDGs identified by WSIS Stakeholders in their respective sessions and workshops: https://www.itu.int/net4/wsis/forum/2017/Agenda/#heatmap
5. WSIS Stocktaking Report 2017: http://www.itu.int/pub/S-POL-WSIS.REP-2017
6. WSIS Stocktaking Success Stories 2017: http://www.itu.int/pub/S-POL-WSIS.SUCC_STORIES-2017
7. WSIS Forum 2017: Report – Implementation of WSIS Action lines for Eradicating poverty and promoting prosperity in a changing world: http://www.itu.int/en/itu-wsis/Documents/wf17/WSISActionLinesSupportingImplementationOfSDGs-WSISForum2017.pdf
8. A Special SDG9 Session was co-hosted by ITU and United Nations Industrial Development Organization (UNIDO) during the WSIS Forum 2017 and explored a variety of themes linked with SDG9 to ensure collaborative action in achieving SDG9 (Industry, Innovation and Infrastructure) (read outcomes here http://www.itu.int/en/itu-wsis/Documents/wf17/WSISForum2017_ForumTrackOutcomes.pdf)

- **Photographs:** https://www.flickr.com/photos/itupictures/albums/
- **Videos, Interviews and Highlights**: https://www.youtube.com/playlist?list=PLpoIPNlF8P2NR-mXRzpmOx8_hIs_sf0wh

369. **WSIS Forum 2017: Key Achievements (Announcements, Launches, Agreements, Commitments)**

Please find below some key achievements of the WSIS Forum 2017:

- UNGIS reiterated commitment to the implementation of the WSIS Action Lines and alignment of the WSIS and SDG processes. ITU was appointed as the Chair of UNGIS for the year 2017-2018 and the UN Regional Commission for Africa was appointed as the rotating Vice Chairman to strengthen the regional perspective.

- UN Regional Commissions committed to strengthen the action at the regional level, providing the platforms for connecting the dots, i.e. all relevant stakeholders, with the aim of strengthening implementation of the WSIS Action Lines and alignment of WSIS and SDG processes. Series of regional face to face meetings were announced. It is anticipated that WSIS will be included in the UN Regional Coordination Mechanisms and WSIS4SDG will become one of the pillar of the regional SDG Forums.

- Ministerial Round Table emphasized on the importance of the WSIS Action Lines framework that remains the key UN framework to the work on the information and knowledge societies, and reiterated that many national digital agendas were built upon it. Value of the WSIS Forum as the only UN platform for exchanging best practices and advancing implementation of ICTs4SDGs was emphasized. Many Ministers expressed their continued support and strengthened commitment to the WSIS process.

- ITU, WHO and IEEE organized first Hackathon held at WSIS Forum on the issue of e health. Hack for Health was a successful event which brought together 42

participants from 16 different countries across all five UN regions and diverse educational backgrounds ranging from computer science, mathematics and electrical engineering through chemistry, epidemiology and business.

- FAO, ITU and IEEE committed to work on e Agriculture for WSIS Forum 2018 Hackathon - hack against hunger.
- ARM announced that within the framework of the BeHealthyBeMobile initiative, ARM will strengthen its focus on a global goals based behaviour change technology focussing on chronic disease, and a wide variety of other issues, that affect low resource settings. The details of the programme will be launched in the context of the 2030Vision partnership, a U.N. wide initiative looking at how technology can support the achievement of all 17 goals.
- A new toolkit, Bridging the Digital Innovation Divide, has been developed by ITU to help countries develop a Digital Innovation Framework, a set of policies and projects that foster national innovation.
- ITU and Rwanda launched The Rwanda Country Review on the ICT Innovation Ecosystem
- ILO and ITU launched a campaign to train 5 million young people globally by 2030. The 'Digital Skills for Decent Jobs Campaign' is part of the Global Initiative on Decent Jobs for Youth, the first-ever, comprehensive United Nations system-wide effort for the promotion of youth employment worldwide.
- ITU Launched the Global Cybersecurity Index
- The Partnership on Measuring ICT for Development launched a Task Group on ICT for SDGs, that will prepare a thematic list of ICT indicators that aims to complement the monitoring framework for measuring progress towards the achievement of the SDGs. The Agenda 2030 recognizes that ICTs have great potential to accelerate human progress, but only includes 7 indicators in its monitoring framework. The thematic list to be prepared by the Partnership Task Group will try to capture the cross-cutting and multi-faceted contribution of ICT to the SDGs.
- Launch of the Global E-waste Statistics Partnership to increase the availability and quality of e-waste data. This Partnership is made up of ITU, UN University and the International Solid Waste Association (ISWA).
- Assistance by Japan: Ministry of Internal Affairs and Communications, Japan handed over equipment for emergency telecommunications so-called MDRU (Movable and Deployable ICT Resource Unit) to the ITU-D
- Announcement of the GEM-TECH Awards 2017 that will be renamed as Equals in Tech will be held during the IGF here in Geneva, call for nominations will be launched next week.

- In February 2017, ARM joined the Be He@lthy, Be Mobile initiative to collaborate on innovations in health technology for low-resource settings. Under this partnership we are focusing on scaling up behaviour change programs, looking at how different technologies can reach the largest number of people and deliver the greatest impact at the lowest cost. Details of the project portfolio will be announced shortly. The work will also link with the 2030Vision partnership, a U.N.-wide initiative looking at how technology can support the achievement of the 17 Sustainable Development Goals.

- ITU presented the Global ICT Regulatory Outlook 2017, the first of an annual series of reports tracking market and regulatory trends in the information and communication technologies (ICT) sector and their implications across the economy

- Several Multistakeholder Agreements during Workshops: to work together in the field of ICTs for SDGs by Multistakeholders – eg

- Agreement Signed by eWorldwide Group (eWWG) & Bangladesh Institute of ICT in Development (BIID)on ICTs for SDGs.

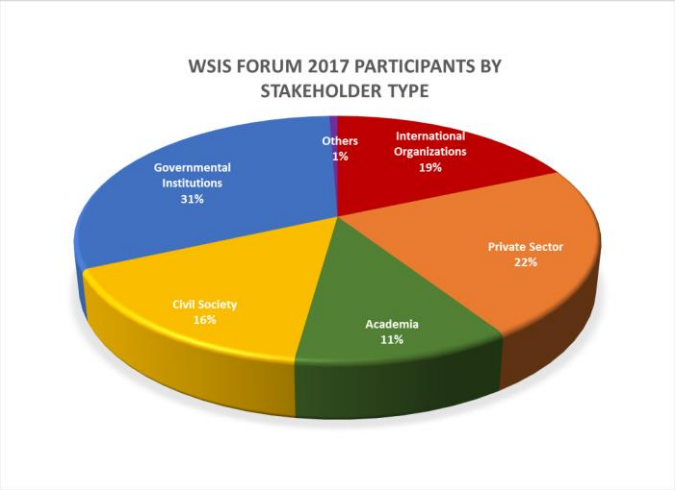
- Learning Foundation announced two major initiatives:
    - The #DigitalScholar education initiative to develop new skills and leadership for the digital transformation of learning
    - The #DigitalScholar call for proposals to develop projects to tackle complex challenges around one or more SDGs

- Grenoble École de management, in follow up, will launch a new research project "Cybersecurity as competitive advantage for companies" in line with the SDGs

- At the workshop on Regional Engagement in Internet Governance a key announcement was made an internet governance event in Johannesburg, South Africa on 23 and 24 June.

- Announcement was the setting up of links between digital humanities, social science, anthropology, linguistics on one side and the scientific community and experts for ICT on the other side. This will be effective at the World Conference on Humanities in Liege, 6-12 August 2017, for WSIS FORUM 2018 and other events, through appropriate channels like Semantis, ISCC-CNRS, LACITO-CNRS, (Paris), Cecua Academy (EU), etc

370. **WSIS Forum 2017 Participation:**



371. **Hackathon - Hack for Health**

ITU and IEEE in collaboration with Be He@lthy, Be Mobile (ITU-WHO)

The first ever hackathon was organized during the WSIS Forum 2017, it resulted in the development of innovative digital solutions addressing four challenges relevant to middle- and lower-income population in cities. Over the course of two days, 42 students (17 female, 25 male) from 16 different nations representing all five United Nations regions competed as teams to develop a technological innovation to address one of four challenges. These challenges addressed the following areas:

- Clean water access
- Urban Environmental Quality

- Managing Non-Communicable Diseases for Healthy Living
- Promoting Health Behaviors
  (additional details below in the Hackathon section)

372. **WSIS Forum 2017: Virtual Reality for SDGs**

Pursuing a first partnership in 2016, WSIS and World VR Forum join forces to be at the forefront of Virtual Reality for advancing development. A shiny new Virtual Reality Track was held at the WSIS Forum 2017 bringing together high-level personalities, world class VR experience and a very special focus on education.

The WSIS Forum participants experienced a live demonstration on Virtual Reality for Development where a class of Le Regent College pupils were on Stage. Led by a Teacher, the class had a geography lesson via TeachVR system.

373. **WSIS Forum 2017: Photo Contest**

For the WSIS Forum 2017 Photo Contest, stakeholders were invited to picture how ICTs are playing an enabling role in achieving the SDGs, to participate in building a collage of ICT for Sustainable Development photographs from around the world. The contest was held from 2 March to 22 May 2017. During this period, people were sending photos of their projects, people, and organizations that are leveraging the power of ICTs to make difference.

The three winning entries in the WSIS photo contest were awarded and presented at the WSIS Forum 2017 12-16 June 2017 in Geneva, Switzerland. In addition the winners were invited to join ITU's #ICT4SDG campaign. A dedicated poster and other campaign materials highlighting their work were created and shared within ITU and its stakeholders.

WSIS Forum Photo Contest Winners:

1) Digitally Yours:

A group of women of Baintala village is participating in a disaster preparedness training at night after a long day of domestic works. Parts of Baintala still have no electricity but that did not affect their training as solar powered Tablet devices were used.

Baintala Village, Rampal, Bangladesh

2) Summer Holiday Camp:

During the summer holidays, MindAfrica organizes an enrichment camp for about 120 underserved students from across schools in Port Harcourt, Nigeria. This is a fun, interactive and engaging program that is interdisciplinary and collaborative in its approach. The main objective is to get students to develop problem solving, critical thinking, teamwork, and communications skills. Instructors lead students through a range of hands-on demonstrations and problem-solving designed to show the real-life applications of science, technology, engineering and mathematics (STEM).

Port Harcourt, Nigeria

3) ICTs give us equal opportunities for a better future (Punto Mexico Connectado Project):

An interactive session on robotics, which aims to give children insight and develop their ICTs skills from an early age. Puntos Mexico Conectado Program seeks to bridge the digital divide in order to increase the access to Information and Communications Technologies (ICT) and maximize the endless possibilities they have to offer. The PMC program achieves this objective by installing one center in each state of Mexico, generally located in areas that are highly marginalized with elevated poverty rates. In this way, the program benefits those who are less likely to have access to either connectivity or computers in their everyday life.

374. **TEDxGeneva at WSIS Forum 2017:** Future Crossroads

We are each living through these crossroads, together. This event brings our humanistic approach into focus with speakers and participants at the nexus of these crossroads, each with vastly different experiences drawn from the private sector, civil society, cyber world, and international governance. TEDx is devoted to spreading ideas. During WSIS Forum 2017, We - this diverse network - have spent an immersive evening at the crossroads, forging our experiences together to understand our world.

We see the interplay between speaker and network, between experience and debate to be integral to transcending reaction and living change.

375. **WSIS Forum 2018**

The annual WSIS Forum is a global multi-stakeholder platform facilitating the implementation of the WSIS Action Lines for advancing sustainable development. The Forum is co-organized by ITU, UNESCO, UNDP and UNCTAD, in close collaboration with all WSIS Action Line co-/facilitators and other UN organizations (UNDESA, FAO, UNEP, WHO, UN Women, WIPO, WFP, ILO, WMO, ITC, UPU, UNODC, UNICEF, UNIDO,UNHCR and UN Regional Commissions). It provides an opportunity for information exchange, knowledge

creation and sharing of best practices, while identifying emerging trends and fostering partnerships, taking into account the evolving Information and Knowledge Societies.

In follow up to the outcomes of the UN General Assembly Overall Review of the Implementation of WSIS Outcomes (Res. A/70/125) and with the adoption of the 2030 Agenda for Sustainable Development (Res. A/70/1), the WSIS Forum is constantly evolving and strengthening the alignment between the WSIS Action Lines and the Sustainable Development Goals.

The WSIS Forum is the only event of its kind where the programme and agenda are completely crowdsourced. Therefore, as organizers, ITU, UNESCO, UNCTAD and UNDP, are pleased to announce the Open Consultation Process on thematic aspects and innovations on the format of the WSIS Forum 2018. The process aims at ensuring a participatory and inclusive spirit of the Forum, scheduled to be held from 19-23 March at ITU in Geneva. This process actively engages governments, civil society, the private sector, academia, the technical community and intergovernmental organizations in the preparatory process to ensure broad ownership and further improvements of the Forum.

The Open Consultation Process for the WSIS Forum 2018 is structured in five phases as follows:

- **Phase I: 19 September 2017**: 17:00 – 18:00: Launch of the Open Consultations (Face-to-face meeting during the WG-WSIS)
  - Launch of the WSIS Forum 2018 Website for the Official Submissions
  - Online discussions at Online Knowledge Societies Platform
  - Official submissions to the WSIS Secretariat on the Thematic Aspects and Innovations on the Format to be made via www.wsis.org/forum
  - Open call for nominations for WSIS Forum 2018 Multi-stakeholder High-Level Track Facilitators
  - Launch of the WSIS Photo Contest 2018
- **Phase II: 20 December 2017**: 1st Physical Meeting: Open Forum on Implementation of WSIS Action Lines and WSIS Forum (during IGF)
- **Phase III: 24 January 2018**: 16:30 – 18:00: 2nd Physical Meeting (ITU Headquarters, Geneva)
- **Phase IV: 30 January 2018 -** Deadline for Submissions of Official Contributions and Binding Requests for Workshops
- **Phase V**: **19 February 2018:** Final Brief on the WSIS Forum 2018 (ITU Headquarters, Geneva)

Please refer to www.wsis.org/forum for updates. The Open Consultation Process will include a collection of inputs from regional and national WSIS related events and the physical meetings of the Open Consultation Process will benefit from remote participation.

(b) WSIS Action Lines and SDGs Matrix

376. The vital role of ICTs as a catalyst for development is specifically recognized in the new development framework Transforming Our World: The 2030 Agenda for Sustainable Development, which acknowledges that "the spread of information and communication technology and global interconnectedness has great potential to accelerate human progress and to develop knowledge societies, to bridge the digital divide and to develop

knowledge societies, as does scientific and technological innovation across areas as diverse as medicine and energy".

377. Four targets of the SDGs explicitly recognize the role of ICTs. This applies to the targets on Education and scholarships (4.b) on Gender empowerment (5.b) on Infrastructure for Universal and Affordable access to ICTs and the Internet in the Least Developed Countries (9.c) and more broadly, Goal 17 on Strengthen the means of implementation and revitalizing the global partnership for sustainable development, which calls to enhance the use of enabling technology, in particular ICTs. There are also several references to technology in general throughout the SDGs in which ICTs play an important direct or indirect role.

378. ICTs already empower billions of individuals around the world with wide ranging applications cutting across sectoral boundaries in agricultural productivity; population, health and education; transportation; industry, trade and finance; climate change and protection of our environment; as well as for the prevention and management of disasters, among many others.

379. Internet, mobile technologies and relevant ICT applications and services unquestionably help strengthen governance; empower people, in particular women and youth; enable wider exercise of human rights including freedom of expression; foster social inclusion of marginalized groups; open up employment opportunities; promote cultural diversity; expand access to learning and scientific knowledge; and create efficiencies in basic services including energy and water, to name here just a few.

380. However, we do need to acknowledge that, although access to advanced technologies has grown at a fast pace, the impressive gains observed during the MDG era are still hampered by existing gaps in access to ICTs— inequalities still persist among and within countries, between urban and rural sectors and among men and women. A major digital divide is still in place, with more people offline than online and particularly poor access in Least Developed Countries (LDCs).

381. ITU's latest data reveal that while access to the Internet is approaching saturation levels in the developed world, the Net is only accessible to 35% of people in developing countries. The situation in the 48 UN-designated LDCs is particularly critical, with over 90% of people without any kind of Internet connectivity.

382. With the newly adopted 2030 Development Agenda, the WSIS Forum may need to evolve and adapt to strengthening the linkages between the WSIS Action Lines and the Sustainable Development Goals, as well as in light of the outcomes of the UN General Assembly Overall Review of the Implementation of WSIS Outcomes.

383. **WSIS SDG Matrix**: The WSIS Action line and SDG matrix was launched during the WSIS Forum 2015. The matrix aims to underline the key role of ICTs in promoting sustainable development, all WSIS Action Line Facilitators, under coordination by ITU, developed this WSIS-SDG Matrix demonstrating the direct links between the WSIS Action Lines and the proposed SDGs. Please see at : http://www.itu.int/net4/wsis/sdg/

(c) WSIS Prizes

384. Each year, on the occasion of the WSIS Forum, 18 WSIS stakeholders are awarded **WSIS Prizes**, as a unique mark of global recognition for excellence in the implementation of WSIS outcomes. WSIS Prizes honour outstanding projects that leverage the power of ICT to accelerate socio-economic development around the globe. To this end, 18 projects are selected as the most successful stories worldwide, under each category, to serve as best-practice models to be replicated by other stakeholders interested in information and communication technologies (ICTs) for development. These projects brilliantly demonstrate how established **Sustainable Development Goals (SDGs)** can be realized in concrete actions and inspire other stakeholders all over the world to follow their success. This year, we have continued to implement the **WSIS Prize Champions** category for the **WSIS Prizes 2017** contest.

385. WSIS Prizes is a unique international contest developed in response to requests from the WSIS stakeholders to create an effective mechanism to evaluate and recognize individuals, governments, civil society, local, regional and international agencies, research institutions and private-sector companies for outstanding success in implementing development oriented strategies that leverage the power of ICTs as an enabler of the development. The WSIS Prizes contest is an integral part of the WSIS stocktaking process (www.wsis.org/stocktaking) set up in 2004 to assist WSIS implementation and follow-up. The contest was held for the first time in 2012, and rapidly gained attention and popularity within the ICT for Development (ICT4D) community.

386. Building upon the outcomes of the United Nations General Assembly Overall Review on WSIS as well as the 2030 Agenda for Sustainable Development, the WSIS Prizes 2017 reflect close linkages with achieving the Sustainable Development Goals (SDGs). The WSIS Prizes contest serves as the platform for identifying and showcasing the success stories across the WSIS Action Lines defined in the Geneva Plan of Action and SDGs. It also provides us with models that can be replicated in the interests of empowering the community at the local level, providing everyone with an opportunity to participate in the contest and, most importantly, recognizing the efforts made by stakeholders to contribute to the development of society and their commitment to achievement of both the WSIS goals and SDGs.

387. Facilitated by ITU in coordination with all WSIS stakeholders, the WSIS Prizes 2017 contest provided a platform to identify and showcase success stories across the WSIS Action Lines defined in the Geneva Plan of Action and Sustainable Development Goals. For the fifth year in a row, the World Summit on the Information Society (WSIS) recognized

outstanding success stories from around the world for their part in building an inclusive information society. It is a pleasure to have the opportunity to award the WSIS Prize 2017 winners and champions' dedication and commitment in the implementation of the WSIS Outcomes, while honouring the outstanding projects from the international WSIS community.

388. The International Telecommunication Union (ITU) has announced the top-90 winning Information and Communication Technology for Development (ICT4D) initiatives from around the world competing for prestigious WSIS Prizes 2017, from which one top Winner and four Champions emerged in each of the 18 prize categories. These 18 category Winners were announced and presented with their awards, and Champions honoured, on 13 June at the WSIS Prizes 2017 ceremony held at the Geneva International Conference Centre during WSIS Forum 2017.

389. The WSIS Prizes contest is open to all stakeholders: governments, businesses, civil society, international organizations, academia and others. The contest comprises 18 categories directly linked to the WSIS Action Lines outlined in the Geneva Plan of Action. This year's final list of **345 nominated projects** represented a wide range of stakeholders.

390. This includes, by region: 49 from Africa (14.1%), 45 from the Americas (12.9%), 78 from the Arab region (22.4%), 88 from Asia and the Pacific (25.3%), 41 from the CIS (11.8%), 42 from Europe (12.1%), and five international projects (1.4%); and by sector: 145 from governments (41.7%), 78 from businesses (22.4%), 56 from civil society (16.1%), 22 from international organizations (6.3%.), and 47 from other entities (13.5%).

391. The **WSIS Prize Champions** category recognizes those contenders having emerged from the online voting phase with **1.1 million votes** from the WSIS community. Their projects are among those having received the highest number of votes and having gained the best reviews by the members of the Expert Group.

392. More than 60,000 new members of the WSIS stakeholder community voted this year, and with this, ITU is proud to announce that the WSIS Stocktaking Platform has increased to 300,000 registered stakeholders. This sets a new high for the level of global multi-stakeholder engagement, and implementation of WSIS Action Lines in support of the United Nations Sustainable Development Goals.

393. In line with the inclusive, multi-stakeholder character of the WSIS Process, the prizes recognize the outstanding achievements of a wide range of organizations. This year's 18 Winners, by WSIS Action Lines, are:

- Action Line C1 *The role of government and all stakeholders in the promotion of ICTs for development*
  Winner: Adqar's e-safe school online safety, Kalifa Empowerment Program for Students, United Arab Emirates
- Action Line C2 *Information and communication infrastructure*
  Winner: South-to North water diversion (Eastern route) communication optical cable project for the water resources dispatch and management system, China Communications Technology Co., Ltd., People's Republic of China
- Action Line C3 *Access to information and knowledge*
  Winner: DAISY-standard accessible reading materials for students with visual and print disabilities, Access to Information (a2i) Programme, Prime Minister's Office, People's Republic of Bangladesh
- Action Line C4 *Capacity building*
  Winner: Puntos México Conectado Programme, Ministry of Communications and Transportation, Mexico
- Action Line C5 *Building confidence & security in the use of ICTs*
  Winner: Multimedia distance-learning course on the safe use of Internet resources, A.S. Popov Odessa National Academy of Telecommunications, Ukraine
- Action Line C6 *Enabling environment*
  Winner: Egypt's National Program for ICT Accessibility in Education for Persons with Disabilities, Ministry of Communications and Information Technology, Arab Republic of Egypt
- Action Line C7 *E-government*
  Winner: Rendering of state and municipal services in electronic format, Cabinet of Ministers of the Republic of Tatarstan, Russian Federation
- Action Line C7 *E-business*
  Winner: National Trade Platform, Singapore Customs, Republic of Singapore
- Action Line C7 *E-learning*
  Winner: E-learning and Virtual Classroom System, Kuwait University, State of Kuwait
- Action Line C7 *E-health*
  Winner: Informed: an innovation, socializing project at the service of Cuban public health; National Information Center for the Medical Sciences, Cuba
- Action Line C7 *E-employment*
  Winner: Social Network for Health Promoting Hospital, Advanced Info Services, Thailand
- Action Line C7 E-environment
  Winner: Greenmap Belarus, Ministry of Natural Resources and Environment Protection of the Republic of Belarus, Republic of Belarus

- Action Line C7 *E-agriculture*
  Winner: Electronic Application System, Rural Support Service, Republic of Latvia
- Action Line C7 *E-science*
  Winner: Communication Technology and Networking for Development, World Science Project, Ghana
- Action Line C8 *Cultural diversity & identity, linguistic diversity*
  Winner: Turkcell "Hello, Hello" Mobile App for Integration of Syrian Refugees, Turkcell, Turkey
- Action Line C9 *Media*
  Winner: Agribusiness TV, MediaProd, Burkina Faso
- Action Line C10 *Ethical dimensions of the Information Society*
  Winner: Internet Sehat (Internet Healthy) Towards Indonesian Information Society, ICT Watch – Indonesia, Republic of Indonesia
- Action Line C11 *International & regional cooperation*
  Winner: African School on Internet Governance, Association for Progressive Communications, Republic of South Africa

Detailed descriptions of all WSIS Prizes 2017 winning projects are available at: https://www.itu.int/net4/wsis/prizes/2017/

Detailed descriptions of winning projects are available here. Video interviews and photos of winners along with live and archived event webcasts and transcripts of speeches can be found at http://groups.itu.int/stocktaking/WSISProjectPrizes.aspx#home or on the main event website at www.wsis.org/forum.

394. It is critical to highlight the importance of the multistakeholder and bottom-up approach that is the essential philosophy of the WSIS Forum. Stakeholders highly appreciated the multi-stakeholder approach of the contest and highlighted the importance of the continuation of this contest to serve as a mechanism to recognize stakeholders for their efforts on the implementation of WSIS outcomes.

395. ITU is pleased to announce the imminent launch and official 2017-2018 call for updates and new entries relating to new ICT-related projects, via our WSIS Stocktaking platform. All stakeholders benefit from the sharing of interesting case studies, as this undoubtedly facilitates the transfer of knowledge, experiences and models for project implementation. The WSIS Platform helps to create partnerships and to provide greater visibility and add value to ICT projects all around the world.

396. All stakeholders are urged to encourage their networks to join the WSIS Prizes process, including the multistakeholder open consultation process for the WSIS Forum 2018, in order to ensure that all features correspond to the real needs of the WSIS implementation process towards 2025. Phase one will open the call for submissions to the contest of the WSIS Prize 2017. All stakeholders are invited to submit WSIS related projects to the WSIS Prize 2018 contest. In order to process the submission, stakeholders are requested to complete the submission form for WSIS Prize 2018 online at www.wsis.org/prizes.

397. ICTs are enablers for sustainable development, and reporting on ICT success stories to best showcase the possible achievement of SDGs is the major objective of WSIS Stocktaking process, including WSIS Prizes, as already recognized and anticipated by the WSIS stakeholders community. The contest thus comprises 18 categories which are linked to the 11 WSIS Action Lines outlined in the Geneva Plan of Action and SDGs. Submitted projects are to be recognized solely for the 18 categories covering the 11 WSIS Action Lines.

WSIS Prize 2018:

398. ITU is pleased to announce the launch of the 7th edition of the contest of the WSIS Prizes and call for submissions through the website (www.wsis.org/prizes) by 2nd January 2018. WSIS Prizes 2018 are the exceptional international recognition of WSIS Stakeholders as Winners and Champions for their excellence in supporting the implementation of WSIS outcomes, in particular WSIS Action Lines supporting achievement of Sustainable Development Goals (SDGs).

399. The WSIS Prizes contest was developed in response to requests from the WSIS stakeholders to create an effective mechanism to evaluate projects and activities that leverage the power of information and communication technologies (ICTs) to advance sustainable development. Since inception, the contest of WSIS Prizes has attracted more than 300.000 stakeholders

400. **FIVE PHASES OF THE CONTEST**

1. The first phase: Submission phase

   11 September 2017 – 2 January 2018 (Deadline for last submission: 23:00 Geneva time)

2. The second phase: Nomination Phase. Revision of submitted projects by Expert Group that will result with a list of nominated projects

   3 January 2018 – 12 January 2018

3. The third phase: Public Online Voting (identification of three projects per category with the highest number of votes)

   12 January 2018 – 4 February 2018 (Deadline for casting last vote: 23:00 Geneva time)

4. The fourth phase: Selection of winning projects by the Expert Group that will result with a list of winning projects

   5 February 2018 – 9 February 2018

5. The fifth phase: Announcement of winners to the public during WSIS Prize 2018 Ceremony at WSIS Forum 2018, and the release of publication "WSIS Stocktaking: Success Stories 2018", which is a compilation of extended descriptions of the 18 projects and 72 champion projects.

(d) WSIS Stocktaking Portal

401. All stakeholders benefit from the sharing of interesting case studies, by the undoubtedly facilitation of the transfer of knowledge, experiences, and models for project implementation. The WSIS Stocktaking platform helps to create partnerships, provide greater visibility, and add value to ICT projects all around the world. The many and varied stakeholders who have implemented innovative projects and contributed to the success of the WSIS Stocktaking process deserve our sincere gratitude.

402. WSIS Stocktaking Portal provides a repository of best practices for stakeholders seeking updated information on progress in the implementation of WSIS outcomes (§ 28.e of the Geneva Plan of Action). The WSIS Stocktaking Platform, launched in February 2010, transformed the previous static database into a unique portal to highlight ICT-related projects and initiatives in line with WSIS implementation. The platform offers stakeholders exciting and interactive networking opportunities via Web 2.0 applications.

403. The principal role of the WSIS Stocktaking exercise is to leverage the activities of stakeholders working on the implementation of WSIS outcomes and share knowledge and experience of projects by replicating successful models designed to achieve SDGs. The WSIS Stocktaking process was initiated in October 2004 during the Tunis phase of WSIS, and in the years since then it has come to comprise the database of:

- exchanges of information on projects,
- sharing of best practices of certain regions,
- initiatives related to the implementation of the 11 WSIS action lines
- linkages between the 11 action lines and the Sustainable Development Goals (SDGs) - a linkage that became an essential guidelines of the WSIS Stocktaking process.

404. The WSIS Stocktaking process provides a register of activities, including, projects, programmes, training initiatives, conferences, websites, guidelines, tool-kits, etc., carried out by governments, international organizations, the private sector, civil society and other entities. To that end, in accordance with of the Tunis Agenda for the Information Society (TAIS) adopted by WSIS, ITU has been maintaining the WSIS Stocktaking Database as a

publicly accessible system providing information on ICT-related initiatives and projects with reference to the 11 WSIS action lines (Geneva Plan of Action) and 17 SDGs.

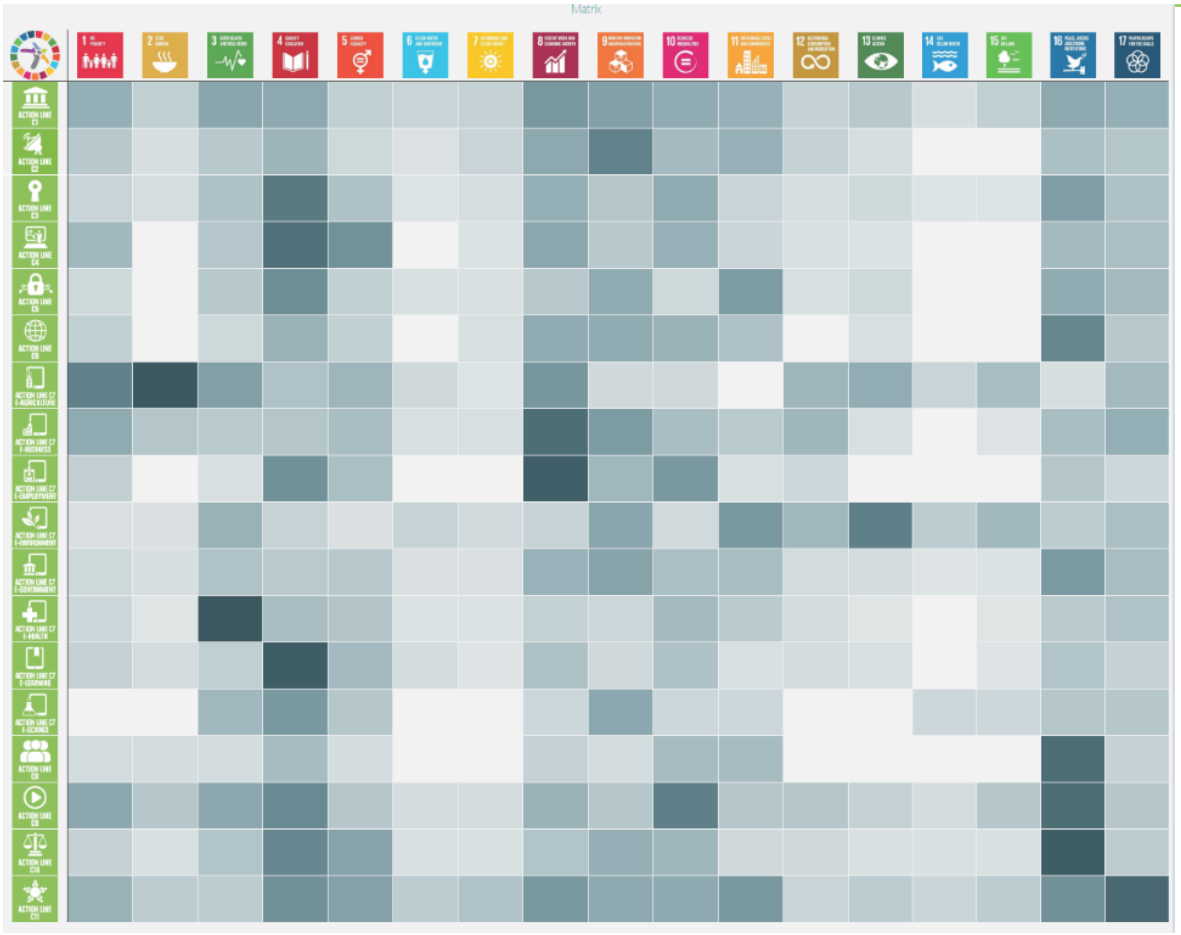
405. As in 2015, the UN General Assembly within the framework of the ten year review of the WSIS (Res.A/70/125) called for a close alignment between the WSIS process and the 2030 Agenda for Sustainable Development (Res.A/70/1). The WSIS Stocktaking process responded by highlighting the contribution of 11 WSIS Action Lines to the achievement of 17 Sustainable Development Goals (SDGs).

406. The direct linkages between the WSIS action lines and the SDGs set out below are crucial to continuing to strengthen the impact of ICTs for sustainable development. Each UN action line facilitator has analyzed the connections and relations between their respective action lines and the proposed SDGs and their targets to create a clear and direct linkage and an explicit connection between the key aim of WSIS - that of harnessing the potential of ICTs to promote and realize the development goals – and the post-2015 development agenda, so as to contribute to realization of the latter.

407. At the WSIS Forum 2015, the SDG matrix was extremely well received by the WSIS community, offering as it does a better explanation of the potential of ICTs as enablers for sustainable development. A new component was introduced in the WSIS Stocktaking process in the form of reporting ICT success stories to best showcase the possible achievement of SDGs through the implementation of WSIS action line-related projects. The majority of the collected submissions in 2017 clearly showcase the linkage between their related action lines and the various SDGs and targets.

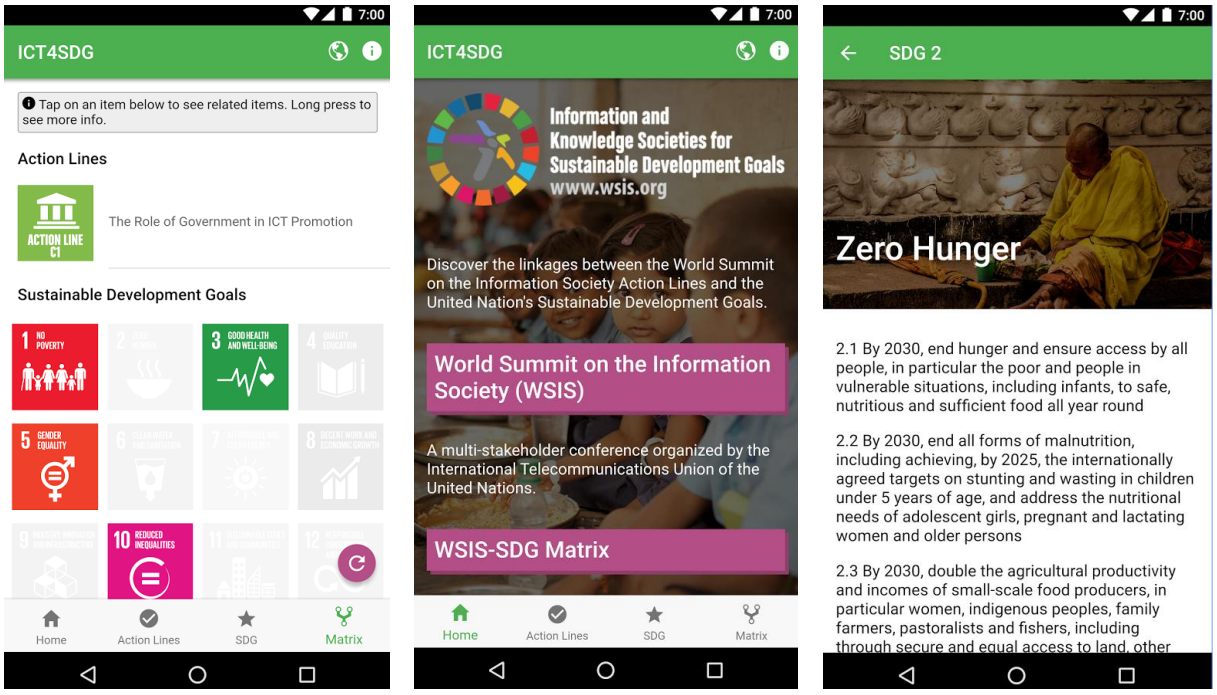
408. WSIS Stocktaking Platform was introduced in 2010, providing a repository of best practices for stakeholders seeking updated information on progress in the implementation of WSIS outcomes (§ 28.e of the Geneva Plan of Action), continues to foster implementation of the WSIS outcomes and to facilitate exchange of information among its community of 300.000 WSIS Stakeholders representing governments, the private sector, international organizations, civil society, and others. We continue to maintain and improve the WSIS Stocktaking Database, which contains around 10.000 entries so far. This encouraging outcome reinforces stakeholders' belief in and commitment to the WSIS Stocktaking process and their desire to share best practices.

409. New WSIS Stocktaking products were introduced in 2017 with positive feedback from the WSIS stakeholders who showed much interest in using them. One such products has been designed in a form of an interactive matrix that is to be used as a graphical representation of WSIS and SDG data collected through the implementation of the WSIS Stocktaking process, where the individual values contained in a matrix are represented colorfully:



410. Shifting from theory to practice and impact, using the data from the WSIS Stocktaking platform, including projects submitted for the WSIS Prizes in past two years (when we have started to reflect on SDGs), the objective of this product is to draw conclusions from the automated matrix providing strength of proposed links between WSIS Action Lines and SDGs, and the analysis of connections and relations between the respective Action Line with the proposed SDGs and their targets, as proposed by each Action Line Facilitator.

411. Furthermore, using the data provided for the WSIS Stocktaking process in 2016 and 2017, in cooperation with the WSIS Prizes 2016 Champion, AgriNeTT from the University of West Indies, Trinidad and Tobago, the WSIS team has been developing a mobile application aiming to provide information on the linkages between WSIS Action Lines and SDGs. The launch of this application took place during the World Café on WSIS Stocktaking at the WSIS Forum 2017, providing a quick access to relevant information on WSIS Action Lines and SDGs to WSIS Stakeholders community at the Forum and beyond It portrays the WSIS-SDG Matrix, developed at WSIS Forum 2015 together with the UN Action Line Facilitators, with detailed information on each WSIS Action Line and SDG. New edition of the application is soon to be released showing the linkages on the ground by listing the projects submitted for the WSIS Stocktaking in past two years, since we started monitoring SDG process within the WSIS Stocktaking. This application was much appreciated and welcomed by the community at the WSIS Forum 2017 with a vibrant discussion on how to best use it, while new features were proposed to be considered in the future editions.



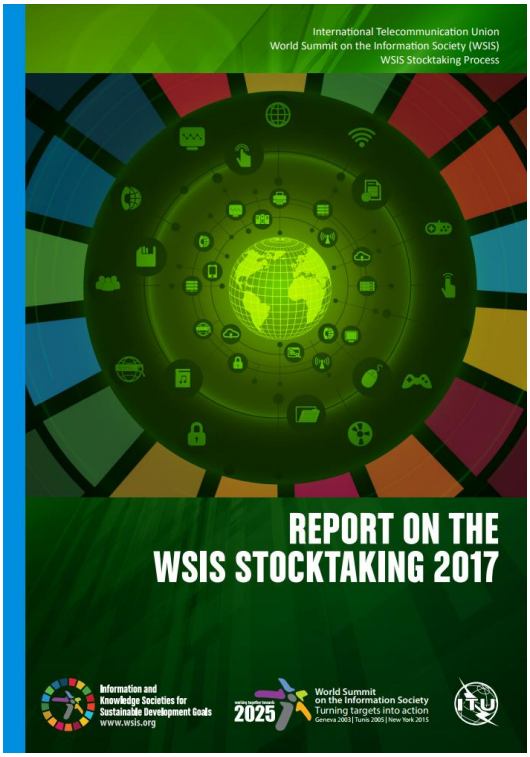
412. In 2017, as requested by the WSIS community during the WSIS Forum 2017, we have developed a **WSIS Stocktaking embeddable interface**, product that has much potential in expending the WSIS Stocktaking process through the WSIS multistakeholder community by uploading the WSIS Stocktaking platform in a form of an iFrame on portraying it on their websites and platforms. Visitors will be able to view live entries (live results are customizable upon a particular WSIS Action Line or SDG or region or other data focus relevant to the user), search the WSIS stocktaking database within partners' websites environment, and to submit ICT-related projects from the embeddable WSIS Stocktaking interface for the WSIS Prizes contests or for the WSIS Stocktaking reports. We invite all stakeholders to take part in this unique opportunity towards evidence based policy making and promote it within different communities and networks. The WSIS Team will provide the necessary information, sufficient to test and run the interface, upon request.

413. The new call for update and new entries 2017-2018 will be launched in September 2017 and we invite you to submit entries online at www.wsis.org/stocktaking. Submitted activities will be reflected in various forms in the WSIS Stocktaking 2018 (reports, exhibitions, videos etc.) which will be released at WSIS Forum 2018. We look forward to receiving your responses to this call. Timeline of this process will soon be announced. Should you have any questions or need for assistance, please do not hesitate to contact the WSIS Team at wsis-stocktaking@itu.int

414. In coordination with ITU Sector for Standardization (TSB), the WSIS team is currently preparing an additional track within the WSIS Stocktaking platform for collecting international best practices of the artificial intelligence (AI) for development, striving to provide tangible overview of projects and initiatives in this emerging field. Although customized for the needs of the AI for Good Global Summit and TSB objectives, the inputs will also be reflecting the essential components of the WSIS Stocktaking, namely all inputs

will reflect projects' implementation of the WSIS Action Lines and how ICTs are advancing sustainable development around the world using innovative technologies.

(e) WSIS Stocktaking Publications



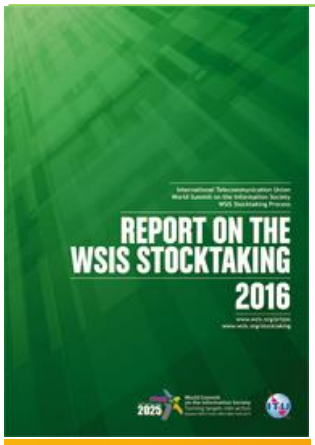
415. More than **600 ICT-related projects** from around the world were submitted for the WSIS Stocktaking Report 2017 by the WSIS Stakeholder community. The ninth edition of the WSIS Stocktaking set a new record of global multistakeholder engagement in implementation of WSIS Action Lines for SDGs. The Report will be presented during the **WSIS Forum 2017**, 12-16 June 2017 in Geneva, Switzerland. At the same occasion, an interactive session will be dedicated to presentation of the results of this year's WSIS Stocktaking and to listen to the voices of the WSIS stakeholders community on how to improve the process in the future.

416. The 2017 edition of the WSIS Stocktaking Report is the continuation of the WSIS Stocktaking Report series . This ninth edition in the series reflects around 427 activities utilizing ICTs for development, submitted to the WSIS Stocktaking Platform for the period January 2016 March 2017, each one highlighting the efforts deployed by stakeholders involved in implementation of the SDGs. The report is based on the multi-stakeholder approach, including input from stakeholders from all over the world responding to ITU's official call in 2016 for stocktaking updates and new entries. The inputs from WSIS action line facilitators and co-facilitators also contributed to the present report.

417. The WSIS Stocktaking database (www.wsis.org/stocktaking) was introduced in 2010 and currently has 10.000+ entries and a growing community of 300.000 stakeholders. It is a unique global tool for collecting information and regular reporting on information and communication technology related initiatives and projects, carried out by governments, international organizations, the business sector, civil society, academia and other entities, in the context of 11 WSIS Action Lines. The WSIS Stocktaking process has been maintained by ITU since 2004 as requested by the WSIS Outcomes (TAIS, Para 120).

418. Since the WSIS Stocktaking Process was established, eight editions of global WSIS Stocktaking Reports have been published, providing an overall picture of progress and an insight into latest WSIS-related activities. Following the 2016 Report, the ninth report also focuses on contributions by stakeholders worldwide to WSIS and Sustainable Development Goals. This Report seeks to provide key findings on emerging trends in the development of the information society, and references major activities being implemented in the eighteen areas covered by the eleven WSIS action lines and seventeen SDGs.

All WSIS-related publications, including the WSIS Stocktaking reports, are available to download at the ITU Bookshop.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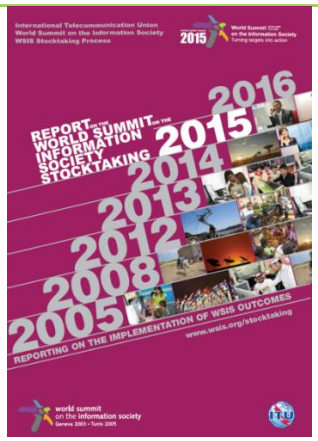
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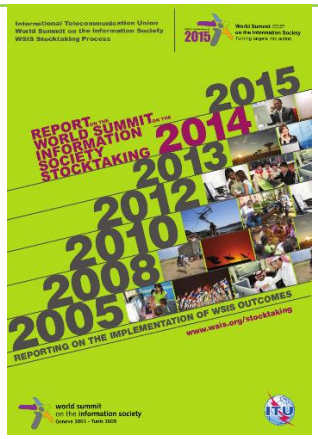
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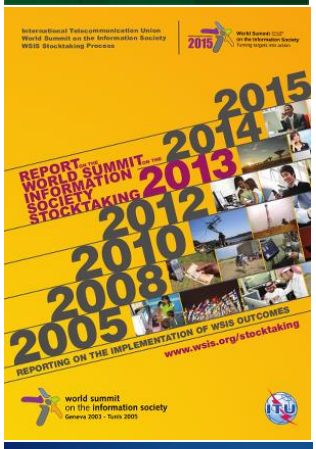
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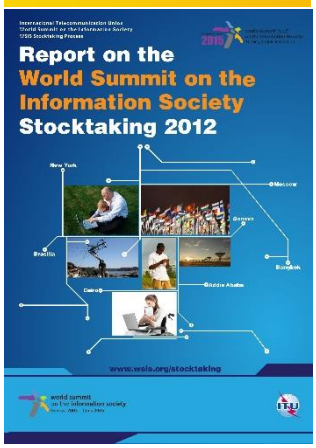
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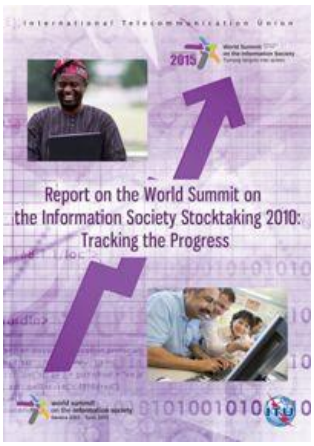
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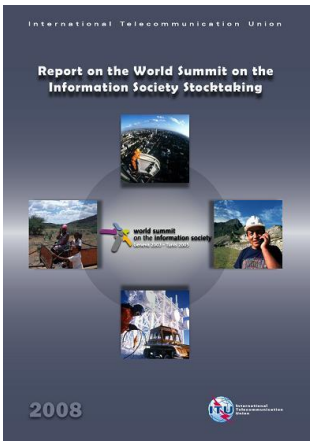
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419. The United Nations Economic and Social Council (ECOSOC) resolution 2016/22 on "Assessment of the progress made in the implementation of and follow - up to the outcomes of the World Summit on the Information Society" reiterates the importance of sharing best practices at the global level, and, while recognizing excellence in the implementation of the projects and initiatives that further the WSIS goals, encourages all stakeholders to submit ICT - related projects and initiatives to the WSIS Stocktaking platform.

420. The same Resolution also reiterates the importance of recognizing excellence in the implementation of the projects and initiatives that further the goals of the World Summit on the Information Society process, and encourages all stakeholders to nominate their ICT-related projects for the annual WSIS Prizes contest as an integral part of the WSIS Stocktaking process. With the year-round ongoing call for updates and new entries, all stakeholders are invited to continue sharing best practices on the WSIS Stocktaking Platform and emphasize how ICT-related initiatives and projects are enabling SDGs.

(f) Launch of the WSIS Forum Photo Competition 2017

421. The World Summit on Information Society (WSIS) Forum launched in 2017 its first-ever photo contest – asking WSIS stakeholders community to picture a more sustainable world, with the theme: Information and Knowledge Societies for Achieving the Sustainable Development Goals.

422. WSIS Forum invited the community to picture how Information and Communication Technologies (ICTs) are playing an enabling role in achieving the Sustainable Development Goals (SDGs). 251 photos were submitted and more than 53 were selected as finalists and participated in building a collage of ICTs for SDGs photographs from around the world. Photos of projects, people, and organizations that are leveraging the power of ICTs to make difference were collected in the contest that ran from 2 March to 22 May 2017.



423. The three winning entries in the WSIS photo contest were presented at the WSIS Forum 2017 12-16 June 2017 in Geneva, Switzerland. In addition the winners were invited join ITU's #ICT4SDG campaign. A dedicated Photo Exhibition was set up at the WSIS Forum

2017 attracting many visitors and positive feedback, and it continues to be exposed in the ITU HQ. All photos are also reflected in the WSIS Stocktaking Report 2017.

(g) Hackathons and Knowledge Café

Hackathon Winners

1. **ITU Acceleration Award: Team Norway**
   SAGA: Bridging the Gap Between Folklore and Fact
   Challenge: Improve citizen awareness of healthy behaviors and promote healthy habits, such as increased physical exercise, proper nutrition and stress management.
   Solution: An interactive kid-friendly media (ebooks, games, cartoons) presented on a website which incorporates local folklore with a factual twist to help teach children healthier eating habits.
2. **ITU Acceleration Award: Team Poland**
   NCD Management for Healthy Living
   Challenge: Allow for self -diagnosis, treatment, and greater disease awareness in those individuals with non -communicable illnesses, such as diabetes and heart disease .
   Solution: An application that gathers air pollution data using sensors and feeds it into an algorithm that provides relevant information for government and citizens

to incite healthy practices. Citizens participate in change by installing sensors at their homes to provide more accurate data. This allows them to draw benefits in return.

3. **IEEE Excellence in Ethics Award: Team Tunisia**
   Urban Environmental Quality

   Challenge: Air pollution is increasing exponentially and serves as a major contributing factor to a wide-variety of global health issues .

   Solution: A two -sided application to analyze eating patterns for better health. The mobile patient app cquires basic medical data, physical activities, allergies, environmental conditions, and more, which gives context to the user's eating behaviors and includes a product scanner for supermarket use to evaluate purchases. The doctor side web service monitors the patient data and makes recommendations for food intake and physical activity for best health. The data will allow for the use machine learning and a classification algorithm to improve the system with less human input.

(h) The Global Cyber Security Agenda (GCA)

424. In May 2007, ITU launched the GCA: a framework for international cooperation in cyber security. The GCA has seven main strategic goals and is built around the following five work areas or pillars: (1) Legal Measures; (2) Technical and Procedural Measures; (3) Organizational Structures; (4) Capacity Building; and (5) International Cooperation. It acts on existing national and regional initiatives to avoid duplication of work and encourage collaboration amongst all relevant partners. Within the overall framework of the cyber security agenda (GCA), ITU along with its partners, are deploying joint services. These services harmonize, at the international level, different national approaches to better prepare countries to face cyber threats and solve cyber-attacks. This is achieved through information sharing, awareness raising and trainings programs. The momentum generated by the GCA and the broad nature of this ITU initiative have resulted in interest from other stakeholders and opportunities for collaboration and cooperation. More on activities under the GCA can be found in the Section on Action Line C5: Building Confidence and Security in the use of ICTs.

(i) Connect 2020 Agenda for global telecommunication/ICT development

1. Background

1.1. At the 2014 Plenipotentiary Conference (PP-14), ITU Member States adopted Resolution 200 (Busan, 2014): “Connect 2020 Agenda for global telecommunication/ICT development”, establishing a set of global targets to be achieved by the whole Union by 2020 in the areas of *growth*, *inclusiveness*, *sustainability*, and *innovation, and partnerships* in the telecommunication/ICT sector.

1.2. Resolution 200 invites ITU Member States to participate actively in the implementation of the Connect 2020 Agenda; to contribute with national, regional, and international initiatives; to provide data and statistics, as appropriate, to monitor progress towards the achievement of the Connect 2020 goals and targets; and to engage all stakeholders through the promotion of partnerships around the Connect 2020 Agenda.

1.3. At PP-14, ITU Member States also adopted Resolution 71 (Rev. Busan, 2014): "Strategic plan for the Union for 2016-2019", which incorporates the Connect 2020 goals and targets into the framework of ITU's strategic plan for the 2016-2019 period.

2. Progress for the reporting period

Measurement, monitoring and reporting

2.1. The four goals of the Connect 2020 Agenda include 17 targets, designed to provide an indication of progress towards the achievement of the goals up to 2020.

2.2. The progress towards the Connect 2020 Global Telecommunication/ICT Targets are presented in the "Report on Implementation of the Strategic Plan and Activities of the Union". The section on Strategic Goals of the Union provides the latest analysis on the progress, based on the indicators and statistics collected and provided by the Telecommunication Development Bureau.

2.3. In particular for Targets 3.2 and 3.3 on e-waste and GHG emissions reduction, roadmaps and methodologies are being developed with ITU membership through the ITU-T Study Group 5 and in collaboration with relevant organizations.

Operationalization of the ITU Strategic Plan 2016-2019

2.4. The ITU secretariat contributed to the progress towards the Connect 2020 Agenda through the implementation of the operational plans of the three Sectors and the General Secretariat.

Raising awareness on Connect 2020 Agenda

2.5. The ITU secretariat focused on raising awareness of the Connect 2020 Agenda among all stakeholders of the ICT ecosystem, building further buy-in of the Connect 2020 targets, improving understanding on the relevance of the framework and further incorporating it in the global agenda.

2.6. In particular, the ITU secretariat contributed to the Special Session of the Broadband Commission with the World Economic Forum, at the Annual Meeting at Davos in January 2017, with a discussion paper that examined where connectivity efforts should be focused or increased within the next three years to achieve the Connect 2020 Agenda. The paper examined in greater detail who and where the unconnected are today, what the key challenges are to meet, in particular Targets 1.2, 2.2.A, 2.2.B and 2.5.A, and what possible measures can accelerate the connection of the unconnected..

2.7. The Connect 2020 Agenda has also been recognized and welcomed by the Resolution of the United Nations General Assembly on the overall review of the implementation of the WSIS Outcomes (A/RES/70/125).

Contribution of the Connect 2020 Agenda to the Sustainable Development Goals

2.8. In order for ITU to respond to the needs of its constituents with regards to the 2030 Agenda for Sustainable Development, the secretariat developed the 'ITU SDG mapping tool', aiming to provide a comprehensive visual overview of how the ITU strategic framework and Connect 2020 Agenda contribute to the Sustainable Development Goals

(SDGs). The tool visualizes the mapping and the linkage of the ITU strategic framework, Connect 2020 Agenda, WSIS Action Lines and the SDGs and Targets.

3. Roadmap for 2017

3.1. ITU will further advance the implementation of Connect 2020 by the end of the year through:

a) *Measurement, monitoring and reporting*: Effective measurement and data analysis is key in meeting the needs of policy-makers and practitioners. Further work required in specific cases to define measurement methodologies will be continued.

b) *Review of the progress towards the Connect 2020 Agenda in view of the 2018 Plenipotentiary Conference:* A thorough review of the status and progress towards the goals and targets of the Connect 2020 Agenda will be undertaken, in order to strategically analyze where connectivity efforts should be focused and prepare for the elaboration of the targets for the next strategic plan of the Union..

c) *Coordinated implementation of the ITU strategic and operational plans contributing to the Connect 2020 Agenda: Ensuring inter-sector coordination on the cross-sectoral thematic areas covered by the Connect 2020 Agenda goals and targets will ensure maximizing the impact of ITU's work.*

4. Measurement and reporting status of Connect 2020 goals and targets

Goal / Target	Status
GOAL 1: GROWTH – Enable and foster access to and increased use of telecommunication/ICTs	
• Target 1.1: Worldwide, 55% of households should have access to the Internet by 2020 • Target 1.2: Worldwide, 60% of individuals should be using the Internet by 2020 • Target 1.3: Worldwide, telecommunication/ICT should be 40% more affordable by 2020	Assessment included in the Report on Implementation of the Strategic Plan and Activities of the Union 2016.

GOAL 2: INCLUSIVENESS – Bridge the digital divide and provide broadband for all	
• Target 2.1.A: In the developing world, 50% of households should have access to the Internet by 2020 • Target 2.1.B: In the least developed countries (LDCs), 15% of households should have access to the Internet by 2020 • Target 2.2.A: In the developing world, 50% of individuals should be using the Internet by 2020 • Target 2.2.B: In the least developed countries (LDCs), 20% of individuals should be using the Internet by 2020 • Target 2.3.A: The affordability gap between developed and developing countries should be reduced by 40% by 2020 • Target 2.3.B: Broadband services should cost no more than 5% of average monthly income in developing countries by 2020 • Target 2.4: Worldwide, 90% of the rural population should be covered by broadband services by 2020 • Target 2.5.A: Gender equality among Internet users should be reached by 2020 • Target 2.5.B: Enabling environments ensuring accessible telecommunication/ICT for persons with disabilities should be established in all countries by 2020	Assessment included in the Report on Implementation of the Strategic Plan and Activities of the Union 2016.
GOAL 3: SUSTAINABILITY – Manage challenges resulting from telecommunication/ICT development	
• Target 3.1: Cybersecurity readiness should be improved by 40% by 2020 • Target 3.2: Volume of redundant e-waste to be reduced by 50% by 2020 • Target 3.3: Green House Gas emissions generated by the telecommunication/ICT sector to be decreased per device by 30% by 2020	Target 3.1: Data included in the Report on Implementation of the Strategic Plan and Activities of the Union 2016. Roadmap for Targets 3.2 and 3.3 being developed with ITU membership and in collaboration with relevant organizations.
GOAL 4: INNOVATION AND PARTNERSHIP – Lead, improve and adapt to the changing telecommunication/ICT environment	
• Target 4.1: Telecommunication/ICT environment conducive to innovation • Target 4.2: Effective partnerships of stakeholders in telecommunication/ICT environment	ITU is working with partners to develop indicators to measure achievement of Targets 4.1 and 4.2.

(j) Broadband Commission for Sustainable Development

425. In May 2010, ITU and UNESCO established the Broadband Commission for Sustainable Development, in response to calls by the UN Secretary-General Mr. Ban Ki-moon to step up efforts by the UN to accelerate progress towards the MDGs. The Commission believes that expanding broadband access in every country will be key to achieve the Sustainable Development Goals (SDGs), and it defines practical ways in which countries at all stages of development can achieve this, in cooperation with the private sector.

426. The Broadband Commission is a significant UN inter-agency initiative and high-profile advocacy group for the benefits of broadband and has succeeded in boosting

broadband up the international agenda. Commissioners represent governments from around the world, academia, relevant industries, international agencies and development organizations, and are all leaders in their field. The group is co-chaired by H.E. President Paul Kagame of Rwanda and Mr Carlos Slim Helú, President of Carlos Slim Foundation, with ITU Secretary-General Mr Houlin Zhao, and UNESCO Director-General, Ms Irina Bokova, serving as joint Vice-Chairs.

427. The Broadband Commission believes that high-speed, high-capacity broadband connectivity to the Internet is essential in modern society, with wide economic and social benefits. It aims to promote the adoption of broadband-friendly practice and policies, so the entire world can take advantage of the benefits. It defines strategies for accelerating broadband roll-out worldwide and examine applications that could see broadband networks improve ICT delivery in healthcare, education, environmental management, safety and across society.

428. Every year, the UN Broadband Commission publishes its annual 'State of Broadband' report in September in New York to take the pulse of the global broadband industry and to explore progress in connecting everyone on the planet via broadband. In 2017, the Commission issued the 4th edition of its annual report: *The State of Broadband 2017: Broadband Catalyzing Sustainable Development.* It features country-by-country rankings based on access and affordability for over 160 economies worldwide.

429. Over the course of 2017, the Broadband Commission pursued a range of work through its Working Groups on: Digital Scorecards, digital health, the digital gender divide, Education and the Working Group on Technologies in Space and the Upper Atmosphere, each of which published a report. The Commission launched further Working Groups for the next year on Vulnerable Countries, Epidemic Preparedness, Digital Entrepreneurship and Digital Health 3.0.

430. By issuing these reports, the UN Broadband Commission for Sustainable Development has made a worthy contribution to the debate about how best to expand broadband access and services and how to achieve digital inclusion for all. The Commission will continue working with many different stakeholders to achieve digital inclusion for all towards the forthcoming sustainable development goals (SDGs).

431. In addition to these reports, the Commission maintains an online portal with a wealth of online resources, country case studies, best practices and regulatory information, as well as the publicly available newsletter.

432. In addition to the working group activities, the Broadband Commission, hosts two regular face-to-face meetings each year to solicit feedback from regional constituents, including ministers and regulators, as well as members of the private sector. Broadband Commissioners debate key issues advance the work of the Commission and typically offer expertise and guidance to guest Ministers and VIPs.

433. The 2017 Spring Meeting of the Commission was held in Hong Kong, China, in March 2017 at the generous invitation of Ms Sun Yafang, Chairwoman of Huawei, and Broadband Commissioner. The meeting discussion included the role of broadband /ICTs in furthering the SDGs and meetings of the Working Groups.

434. The Fall meeting of the Commission will be held in New York, on 17 September 2017 coinciding with the UN General Assembly. The Commission will release its "The State of Broadband 2017" report with a country-by-country snapshot of the state of broadband deployment worldwide. The report reveals that 48% of the world's people are online, with the number of Internet users rising from 3.36 billion in 2016 to nearly 3.55 billion by the end of this year. However, by the end of 2017, 52% of the world's population – are not using the Internet.

In January 2017, the UN Broadband Commission for Sustainable Development also held a Special Session at the annual meeting of the World Economic Forum (WEF) co-organized with the World Economic Forum and ITU at Davos. This special session debated the theme of digital inclusion for all and explored the key reasons behind lack of connectedness.

(k) AI for Good Global Summit

Introduction

435. The "AI for Good Global Summit" took place at ITU in Geneva, Switzerland, on 7-9 June 2017, organized by ITU and the XPRIZE Foundation, in partnership with 20 UN agencies. Artificial Intelligence (AI) will be central to the achievement of the Sustainable Development Goals (SDGs) and could help solving humanity's grand challenges by capitalizing on the unprecedented quantities of data now generated on sentiment behavior, human health, commerce, communications, migration and more. The Summit aimed to accelerate and advance the development and democratization of AI solutions that can address specific global challenges related to poverty, hunger, health, education, the environment, and others.

436. Along with the XPRIZE Foundation, ITU partnered with the following UN partners, most of which helped design the breakthrough sessions: UNIDO, OHCHR, UN Global Pulse, UNICRI, ILO, WFP, UNITAR, WHO, UNESCO, ICAO, WIPO, UNFCCC, UN DESA, UNICEF, IFAD, UNODA, UNCTAD, UNHCR, UNIDIR, and UNODC.

437. The Summit hosted 499 participants onsite (excluding ITU staff), most of which were new to ITU or the UN. One third of participants and speakers were women. There were also over 5000 connections to the webcast from all corners of the globe.

438. AI experts have said themselves that we cannot leave AI to just the experts – a multi-stakeholder approach is needed. As such, this Summit brought together a unique mixture of many disciplines, with some of the top AI researchers (Stanford, UC Berkeley, Cambridge, etc.), top AI industry executives (Microsoft, Google, Facebook, etc.), and heads of UN agencies (WHO, UNODA, UNESCO). Delegates appreciated the ample networking opportunities that having such diverse participants brought.

439. This ITU Summit also catalyzed a number of new collaborations including IBM and UNICEF, ITU and WHO, and ITU and the ICRC. However, reflective of the state of the industry itself, participation was US and European dominated. There was little participation from other regions, in particular Asia and the developing world.

440. The heart of the Summit took place in 16 breakthrough sessions around topics like ending hunger, ethics, privacy, security, education, smart cities and more. Each of the AI

for Good Global Summit's 16 breakthrough sessions aim to produce one or two impactful, actionable strategies to encourage the responsible development of AI. A 'roadmap for collaboration' is expected to encourage UN Member States and other stakeholders to rally around strategies with potential to tackle the greatest challenges of our time, challenges encapsulated by the UN Sustainable Development Goals. It could contribute to stakeholder discussions of AI's role in advancing the UN's mission to accelerate progress towards a dignified life, in peace and prosperity, for all people.

441. It is likely that the next AI for Good Global Summit will take place at ITU on 16-18 May in conjunction with World Telecommunication Information Society Day (WTISD).

(l) m-Powering Development Initiative

442. In the past years, mobile communications has seen enormous growth worldwide. The mobile phone now offers the potential of becoming a universal communications tool and going well beyond voice and data to deliver new, sophisticated ICT services to improve people's lives.

443. The m-Powering Development Initiative is designed to create a resource and an action plan to deploy ICT services, from m-Health, m-banking, m-Learning, m-Governance to m-Commerce and other m-services. In doing so, it can cut costs and reshape, for the better, public service delivery for many millions of individuals, particularly those living in in remote or rural areas of the world.

444. During the first cycle, the m-Powering Development Initiative identified many particular approaches and real-life examples from around the world that could prospectively be adopted elsewhere and detailed a series of recommendations.

445. The second cycle of the Initiative was launched with the appointment of a new Advisory Board of Eminent senior experts drawn from the public and private sectors in 2016. The first meeting of the New Board was held on 13 November 2016 in Bangkok, Thailand, on the eve of the ITU Telecom World 2016. The new Board's work will contribute to the successful implementation of the United Nations adopted Sustainable Development Goals (SDGs) under the 2030 Sustainable Development Agenda.

446. The objectives of the m-Powering Development Initiative is to:

- Harness mobile communications for sustainable development.
- Increase the uptake and usage of mobile services in rural and remote areas.
- Create an enabling environment to foster affordable access to mobile services, particularly where there is a social need.
- Create synergies with existing initiatives and avoid duplication between initiatives.
- Optimize the use of scarce resources.
- Encourage partnerships between different stakeholders, and on as large a scale as possible.

447. The Second meeting of the Advisory Board was held in June 2017, in Geneva, Switzerland. The Board reviewed the work achieved by the established working groups and discussed the next steps to move forward towards the fulfilment of the initiative's objectives.

For more information, please visit:

http://www.itu.int/en/ITU-D/Initiatives/m-Powering/Pages/default.aspx

(m) Smart Sustainable Development Model Initiative

448. The number of natural disasters are on the rise. Information and communication technology for disaster management – ICT4DM – can help respond to and recover from the hardship and damage caused to millions of people. At the same time, ICT for development – ICT4D – remains a pressing challenge to enable people and communities to truly participate in the global digital world.

449. The Smart Sustainable Development Model Initiative (SSDM) seeks to ensure that information and communication technologies are used for both development and for disaster management with the aim of improving the lives of millions of people across the globe.

450. SSDM is both smart and sustainable. Making this approach pro-active, flexible and configured to both uses is "smart", and giving it a roadmap for the future is "sustainable".

451. During the first cycle of the SSDM Initiative, two reports were released providing a series of recommendations for actions linking ICT for development (ICT4D) and ICT for disaster management (ICT4DM).

452. The second cycle of the SSDM Initiative was launched in 2016 with the appointment of a new Advisory Board of Eminent senior experts drawn from the public and private sectors, The Initiative is coordinated by the Telecommunication Development Bureau.

453. The first meeting of the New Advisory Board was held on 13 November 2016 in Bangkok, Thailand, on the eve of the ITU Telecom World 2016. The new Board's work will contribute to the successful implementation of the United Nations adopted Sustainable Development Goals (SDGs) under the 2030 Sustainable Development Agenda.

454. The 2nd Advisory Board meeting was held in June 2017 in Geneva, Switzerland. The Board discussed the outcomes of the work of the established Working Groups (WGs) and identified ways to move forward towards the fulfilment of the initiative's objectives.

455. The SSDM approach to ICT4D and ICT4DM is to:

- Better harness the potential for ICT and its likely future roadmaps in both development and disaster management.
- Identify, share and transfer best practices in each sector worldwide.
- Optimize the use of scarce resources.
- Encourage planning and co-ordination at national and intergovernmental levels for ICT4D and ICT4DM that takes account of dual-use deployments.
- Encourage stakeholders to work together for sustainable development and to avoid duplication

To find out more about the Initiative or get involved please visit http://www.itu.int/en/ITU-D/Initiatives/SSDM/Pages/default.aspx

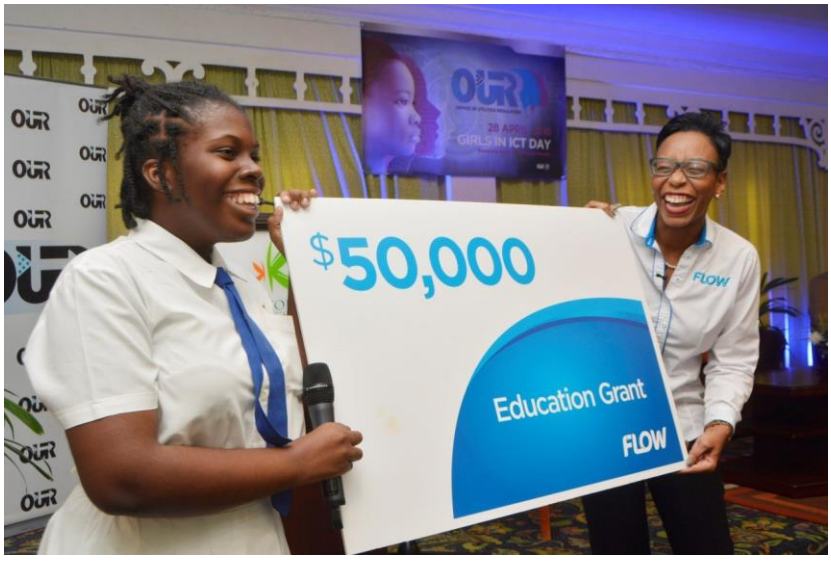
(n) Girls in ICT Day

Girls in ICT Day, Instituto Federal de Telecomunicaciones de México (IFT), Mexico

Girls in ICT Day, Girl Child Network, Sierra Leone

Girls in ICT Day, CISCO

Girls in ICT Day, Universal Communications Service Access Fund, Tanzania



Girls in ICT Day, A young girl receives a scholarship check, Jamaica

456. In 2017, some 70 000 girls from 134 countries participated in over 2 100 events; this includes events held in 30 countries in the Africa region, 33 in the Americas region, 12 in the Arab States, 20 in the Asia-Pacific region, six in the Commonwealth of Independent States and 33 in the Europe region. Awareness about Girls in ICT Day has been raised among tens of millions worldwide and covered by BBC World Service TV in 2017, the #GirlsinICT hashtag that reached over 63 million Twitter accounts for 255 057 360 timeline deliveries. The ITU Girls in ICT Portal received 487 000 page views only in the first half of 2017. This compares to a total of 383 552 views in 2016 and 337 936 views in 2015. The

portal houses a toolkit and branding materials for organizers to use in their events. It also includes a worldwide events map that is linked to pages where organizers can post pictures, videos and descriptions of the results of their events.

457. Since 2011, when the first International Girls in ICT Day was celebrated, over 9 000 events have been held in 166 countries, empowering more than 300 000 girls and young women from around the world. ITU headquarters and all ITU regional offices have organized Girls in ICT Day events.

458. During a WSIS workshop held on 15 June 2017 and attended by 40 stakeholder participants, ITU-D also raised awareness on how ICTs can be used to promote girls' inclusion and access to education (particularly in the areas of science, technology, engineering and mathematics (STEM) and contribute to gender equality and women's empowerment.

www.itu.int/girlsinict.

(o) Equals in Tech Awards -2017

The Equals in Tech Awards initiative is designed to promote gender equality and mainstreaming in technology. The awards are part of EQUALS, an ITU and UN Women global partnership working to achieve gender equality in the digital age – with the support of a growing list of partner companies and non-governmental organizations. In addition to supporting gender equality in the ICT field and advancing the role of women as ICT decision-makers, the awards also showcase how ICTs can be used to dramatically improve social, political and economic outcomes for women and girls.

The Equals in Tech Awards also bring valuable attention to all nominees and the important work that they are doing to bring tech to women and women to tech. As such, nominations are encouraged from all sectors – governments, companies, non-profit organizations, individuals, etc.

The nominated initiatives will be judged by a distinguished panel of partners and previous winners, recognized as Equals in Tech Advisors. Members include representatives of the British Computer Society Chartered Institute for IT, the StrongHer initiative, the Geena Davis Institute on Gender in Media, the World Wide Web Foundation, the Working to Advance STEM Education for African Women Foundation, and the Internet Society.

The Equals in Tech Awards are presented in three categories:

Access: Develop gender-responsive ICT governance, policy and access: initiatives focused on new legislation, policy frameworks or internal corporate strategy to improve women's digital technology access, connectivity and security.

Skills: Encourage women and girls to pursue education in STEM studies: initiatives encouraging more women in the STEM field (science, technology, engineering and math), focusing on the development of more relevant content, and addressing and overcoming cultural and social barriers that women face when entering a STEM education.

Leadership: Promote women in the technology sector: initiatives that promote gender equality in ICT careers, especially initiatives where girls and women are cultivated as creators, developers, leaders and decision-makers.

The prestigious Equals in Tech Awards ceremony will held in Geneva, Switzerland, during the Internet Governance Forum taking place 18-21 December 2017. Final details will be communicated closer to the date.

For more information about the EQUALS initiative and awards, visit: www.equals.org

(p) Roadmaps for WSIS Action Lines C2, C5, C6

459. In line with its mandate and the WSIS outcome documents, the ITU continues to play a key role in the WSIS implementation and follow-up process, in particular, as the WSIS Action Lines Sole Facilitator for AL C2 (Information and Communication Infrastructure), AL C5 (Building Confidence and Security in the Use of ICTs), and AL C6 (Enabling Environment).

460. With the aim of strengthening the implementation mechanism, ITU Council 2009 agreed on the framework for roadmaps of ITU's activities in its role as the sole facilitator for the above mentioned WSIS action lines in the implementation of WSIS up to 2015. Highlighting the important role of ITU in implementing the WSIS Action likes till 2025, revised resolution 1332 in para 3 under resolves instructs us to do the following with regard to the ROADMAP:

461. *updating its WSIS Action Line Roadmaps for C2, C5, and C6 to account for activities underway to also achieve the 2030 Agenda for Sustainable Development;*

462. *providing input, as appropriate, into the roadmap/work plans of WSIS Action Lines C1, C3, C4, C7, C8, C9 and C11, also related to the 2030 Agenda for Sustainable Development;*

463. Roadmaps are detailed plans to guide progress towards achieving WSIS goals, also related to the 2030 Agenda for Sustainable Development. They provide broad vision and detailed overview of the activities planned within the mandate of the Union. Direct links between the activities and the strategic goals and relevant resolutions, programmes and initiatives of the ITU are highlighted. The roadmaps include timeframes, expected results, impact on ITU's human and financial resources as well as list relevant partners.

464. Elaborated framework may serve as a template for the other WSIS Action Line moderators/facilitators to strengthen the implementation mechanism of WSIS process. It has been widely disseminated amongst the WSIS Action Line Facilitators, members of the United Group on the Information Society as well as WSIS stakeholders. The Roadmaps can be accessed at www.itu.int/itu-wsis .

(q) Communication and Outreach

465. WSIS Flash: is a monthly newsletter on WSIS Related news, projects and activities. http://groups.itu.int/stocktaking/WSISFlash.aspx.

466. iwrite4WSISForum is a campaign that aims to empower stakeholders to write and report on all WSIS related events and activities, sharing their work and ideas with thousands of WSIS stakeholders online worldwide. This twitter campaign was introduced for effective and far reaching communication for and amongst WSIS Stakeholders. This empowers all the WSIS Stakeholders to become WSIS reporters and tweet information about their projects and community. http://www.wsis.org/iwrite

467. imeetyouatWSISForum provides all registered onsite participants of the WSIS Forum 2015 with an online social networking community experience. This component of the WSIS Forum has been specially designed for the WSIS Forum 2015 onsite participants www.wsis.org/imeet .

468. WSIS Process on Facebook: The WSIS Facebook page gives opportunity to fans to get informed and actively contribute to the page http://www.facebook.com/WSISprocess

469. @WSISprocess on Twitter: The WSIS Twitter page gives opportunity to fans to get informed and actively participate at the page https://twitter.com/WSISprocess\

470. WSIS Process on YouTube: WSIS Forum highlights, interviews and all the important WSIS Related Videos are available on the WSIS Forum You Tube site: http://www.youtube.com/wsisprocess.

471. WSIS Process on LinkedIn: WSIS Process has a LinkedIn group: https://www.linkedin.com/groups/WSIS-Process-World-Summit-on-2599279?gid=2599279&trk=hb_side_g .

472. WSIS in ITU News: The ITU News is a media partner of the WSIS Process and regularly publishes WSIS Process related articles in several issues https://itunews.itu.int/en/

(r) WSIS Fund in Trust

473. The WSIS Trust Fund was established in 2011 with the adoption of Plenipotentiary Conference Resolution 140. Council Resolution 1332 as modified by ITU Council in May

2016 takes into account the outcomes of the United Nations General Assembly Overall Review of the Implementation of WSIS Outcomes and the 2030 Agenda for Sustainable Development, and resolves to maintain the fund to support ITU activities to facilitate the implementation of WSIS outcomes, calls for partnerships and strategic alliances, and invites the ITU Membership to make voluntary contributions to the fund.

474. Since its creation, information on the WSIS Trust Fund and stakeholder contributions has been reflected at the dedicated website: www.itu.int/itu-wsis/fund. This provides an opportunity to thank all those who have contributed towards the Trust Fund to date for their dedication and commitment towards WSIS Implementation, in particular the WSIS Forum. The outcomes of the WSIS Forum 2016 can be found here: http://www.itu.int/net4/wsis/forum/2016/Outcomes/. Moving towards 2025, and following the multi-stakeholder approach, the WSIS Forum will build upon the outcomes of the WSIS+10 Review and the 2030 Agenda for Sustainable Development.

The ITU would like to thank all WSIS Stakeholders who have generously contributed to the WSIS Fund in Trust, the names of all contributors are reflected in the dedicated site of the WSIS Fund in Trust http://www.itu.int/en/itu-wsis/Pages/WSIS-Fund-in-Trust.aspx . We thank Japan, Poland, Philippines, Rwanda, Switzerland, World's Global Telecom, IEEE, GeSI, ICANN, Internet Society (ISOC), and VEON, IFIP, CMAI, TEMA India and Swiss Engineering for their contribution to the WSIS Fund in Trust in 2017 to accelerate the implementation of the WSIS related activities undertaken by ITU.

The call for WSIS Fund in Trust 2018 is now open the invitation to contribute and the WSIS Forum 2017 Packages are available here: http://www.itu.int/en/itu-wsis/Pages/WSIS-Fund-in-Trust.aspx .

(s) Future Actions

1) WSIS Forum 2018 (Open Consultation Process) www.wsis.org/forum

The Open Consultation Process for the WSIS Forum 2018 is structured in five phases as follows:

- **Phase I: 19 September 2017**: 17:00 – 18:00: Launch of the Open Consultations (Face-to-face meeting during the WG-WSIS)
  - Launch of the WSIS Forum 2018 Website for the Official Submissions
  - Online discussions at Online Knowledge Societies Platform
  - Official submissions to the WSIS Secretariat on the Thematic Aspects and Innovations on the Format to be made via www.wsis.org/forum
  - Open call for nominations for WSIS Forum 2018 Multi-stakeholder High-Level Track Facilitators
  - Launch of the WSIS Photo Contest 2018
- **Phase II: 20 December 2017**: 1st Physical Meeting: Open Forum on Implementation of WSIS Action Lines and WSIS Forum (during IGF)
- **Phase III: 24 January 2018**: 16:30 – 18:00: 2nd Physical Meeting (ITU Headquarters, Geneva)

- **Phase IV: 30 January 2018 -** Deadline for Submissions of Official Contributions and Binding Requests for Workshops
- **Phase V**: **19 February 2018:** Final Brief on the WSIS Forum 2018 (ITU Headquarters, Geneva)

Please refer to www.wsis.org/forum for updates. The Open Consultation Process will include a collection of inputs from regional and national WSIS related events and the physical meetings of the Open Consultation Process will benefit from remote participation.

2) WSIS Prize - Phases – www.wsis.org/prizes
The contest is organized into five phases:

FIVE PHASES OF THE CONTEST

The first phase: Submission phase

11 September 2017 – 2 January 2018 (Deadline for last submission: 23:00 Geneva time)

The second phase: Nomination Phase. Revision of submitted projects by Expert Group that will result with a list of nominated projects

3 January 2018 – 12 January 2018

The third phase: Public Online Voting (identification of three projects per category with the highest number of votes)

12 January 2018 – 4 February 2018 (Deadline for casting last vote: 23:00 Geneva time)

The fourth phase: Selection of winning projects by the Expert Group that will result with a list of winning projects

5 February 2018 – 9 February 2018

The fifth phase: Announcement of winners to the public during WSIS Prize 2018 Ceremony at WSIS Forum 2018, and the release of publication "WSIS Stocktaking: Success Stories 2018", which is a compilation of extended descriptions of the 18 projects and 72 champion projects.

3) WSIS Stocktaking: 2017-2018 Call for Update and New Entries by 9 February 2018
www.wsis.org/stocktaking

The WSIS Stocktaking process has been maintained by ITU since 2004 as requested by the WSIS Outcomes (TAIS, Para 120). This **publicly accessible WSIS Stocktaking database** (www.wsis.org/stocktaking), currently with 9.000 plus entries and a growing community of 300.000 stakeholders, is a unique global tool for collecting information and regular reporting on information and communication technology related initiatives and projects, carried out by governments, international organizations, the private sector, civil society, academia and other entities, in the context of 11 WSIS Action Lines.

All stakeholders are invited to update and submit new entries online at www.wsis.org/stocktaking. Submitted activities will be reflected in the **WSIS Stocktaking Report 2018**, which will be released at the WSIS Forum 2018 to be held from 19 to 23 March 2018 at ITU Headquarters, Geneva.

VI. Final conclusions

475. The ITU is committed to connecting the world in its role as one of the lead facilitating organizations for the WSIS Process. In 2017 ITU initiated, facilitated and implemented a number of activities related to the implementation of the WSIS outcomes. The three ITU sectors, Radiocommunication (ITU-R), Standardisation (ITU–T), Development (ITU-D), and the General Secretariat were active in this process in their respective areas of expertise, and worked to create an enabling environment for multistakeholder cooperation in line with the goals of WSIS.

476. As the leading UN specialized agency focusing on ICTs, ITU has been organizing activities on its own and with a variety of partners, highlighting and prioritizing the importance of multistakeholder collaboration. Participation from governments, international organizations, civil society, academia and the private sector from all over the world was noted in all these efforts, which contributed significantly to the advancement of the WSIS goals.

477. Building upon the outcomes of the UN Summit on Sustainable Development and the UNGA Overall Review on the Implementation of the WSIS Outcomes, both held in 2015, the alignment of these processes is ongoing and will require strengthened efforts by all stakeholders at all levels – national, regional and global – in order to ensure that the enabling power of ICT is leveraged for achieving the SDGs by 2030.